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# Industry Launching Products, Programs To Break Through Its 'Sales Barriers'

## Seek New Upward Push after 2-Year Slowdown; '59 Could Determine Significant Equipment Trends

PHILADELPHIA—When the air conditioning industry puts its 1959 wares on view for the field at the 14th International Heating & Air Conditioning Exposition, opening Jan. 26 at Philadelphia's Convention Hall, the industry faces what political writers might call "a year of decision."

More properly, it might be called a year of "decisions"—of various kinds. One major question is whether sales of the industry's products can break through some present static levels or plateaus to new highs. Other questions involve the types of equipment that will be most preferred by installing contractors and the ultimate users.

The situation in sales is simply this. After five years (1952 through 1956) of spectacular climbs, particularly in comfort cooling equipment, that marked the industry as one of the nation's growth champions, sales not only flattened out in 1957 and 1958, but actually fell back in many categories. To be specific:

**Year-Round Residential Air Conditioning:** Was moving steadily forward through 1956, although not at hoped-for rate, but fell back to around 140,000 systems per year figure in 1957 and 1958. Caution now shows up in present predictions, but industry hopes for 200,000 unit year in 1959.

**Packaged Commercial Air Conditioners:** Have been on a plateau of around 100,000 units annually for several years. However, actual number of applications in commercial field may be somewhat larger in last few years, because of split systems being used. Replacement market big factor in sales growth.

**Applied or Built-Up Systems:** Have probably held up better than most other categories, as greater percentage of new big-building construction is air conditioned, and more "Class A" existing office building space is conditioned. Major push upwards awaits breakthrough in industrial market.

**Room Air Conditioners:** Hard hit by unfavorable weather and business recession in 1957 and early 1958, will be in hard promotion drive to get up to or past the 1,500,000 mark which it hit in 1955 and 1956.

**Residential Heating:** Industry and government authorities predict shipments in 1959 of 1,225,000 units, about a 5% increase over 1958, but short of peaks reached a couple of years ago. Wet heat, and new forms of heating such as heat pumps and electric resistance heating, are pushing to gain a bigger percentage.

**Auto Air Conditioning:** Was fastest growing segment of the industry saleswise in the past couple of years, but leveled off in 1958, as car sales dropped.

A major factor in the issue of whether or not industry sales can break through to new highs will hinge on a breakaway from

(Concluded on Page 69, Col. 1)

## Inside Dope

By GEORGE F. TAUBENECK

*Learn to live and laugh — thus delay your epitaph*

**Stories of the Week**
**More Dirty Air**
**Salesmen, Please Note**
**Service Is Number One Problem**
**Mrs. John Bull Faces Life—and Refrigeration**
**Final Thought**

### *Stories of the Week*

Baby pigeon simply couldn't get the hang of flying.

"Look, stupid," clucked its mother. "If you don't straighten up and fly right I'm going to tie string around your neck and tow you."

"Please don't, mommy. I don't want to be pigeon-towed."

Overheard in Hollywood night club:

"You and your suicide attempts — did you see this month's gas bill?"

Another tough job a man has is getting back some of his take-home pay after he takes it home.

### *More Dirty Air*

The U. S. Public Health Service announces that there is increasing evidence that air pollution contributes to some forms of cancer and hastens the death of heart patients.

Dr. Richard S. Prindle, chief of the air pollution medical program, declares: "there is definitely more cancer of certain types in polluted-air urban areas, and more heart disease of the arteriosclerotic type and other kinds."

### *Salesmen, Please Note*

The way to many a buyer's heart is through his head, avers master merchandiser Dan Packard. Many times when facts or reasons won't get through, you can make an impression with an idea.

"Remember this when you plan your next visit with a difficult prospect," advises Mr. Packard.

"If this prospect thinks you can give him a useful idea, he will not only see you, but listen to your proposition."

### *Service Is Number One Problem*

Women have lots to say about the problems of getting service, but servicemen have a few complaints of their own, too. Not long ago a Cincinnati serviceman listed requirements for his ideal customer, to wit:

(Continued on Page 26, Col. 1)

## 'Advanced' Items In Spotlight at Builders' Show

CHICAGO—Possibly because the Air Conditioning Show in Philadelphia followed so closely on its heels, the National Association of Home Builders Show here last week attracted little that was new in air conditioning.

Most prominent among the displays of air conditioning and heating equipment manufacturers was new heating equipment, particularly electric heating.

Here are some of the highlights of the exposition put on for home builders, who appeared this year to be most concerned over rising costs of home mortgages and community facilities:

- Westinghouse Electric Corp. drew crowds to an exhibit stressing its new concept of the

(Concluded on Page 4, Col. 3)

## Many New Items, Methods on Tap At ASHAE Show

PHILADELPHIA — How the air conditioning industry has broadened the scope of its products and improved them from the standpoint of both performance and ease of application, will be demonstrated to members of the industry who attend the 14th International Heating & Air-Conditioning Exposition, opening Jan. 26 for a four-day stand.

With more than 450 firms exhibiting, the Exposition is being called "the greatest display in its field ever held on the Atlantic Seaboard." It is being held

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## *Approve Agreement On Temporary Heat*

WASHINGTON, D. C. — The Joint Industry Program Committee of the Plumbing and Pipe Fitting Industry, meeting here recently, unanimously approved and released for publication details of the revised "Pittsburgh Agreement," covering jurisdiction of temporary heat in buildings under con-

(Concluded on Page 70, Col. 4)

## Va. Smelting 'Freon' National Agent

WILMINGTON, Del. — Virginia Smelting Co. became a nationwide sales agent for the "Freon" line of refrigerants, effective Jan. 26, the du Pont company has announced.

(Concluded on Page 69, Col. 5)

## U. S. Court In Final Bid Depository Okay

FRESNO, Calif.—Approval of the new rules adopted by the Bakersfield (Calif.) construction industry bid depository was given by Chief U. S. District Judge Leon R. Yankwich in a modified final judgment filed recently.

(Concluded on Page 70, Col. 1)

## 7 Technical Sessions Set for ASHAE Meeting

PHILADELPHIA — Seven technical sessions including a topical session on comfort and symposiums on hydronics, heat pump performance, and corrosion and water treatment have been programmed for the 65th annual meeting of the Ameri-

(Concluded on Page 69, Col. 4)

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for Refrigeration &
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READING COPPER BRASS TUBE
And RED BRASS PIPE

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WORKS READING, PA.

## Demand for FHA Mortgage Assistance Soared To Record Heights In 1958

WASHINGTON, D. C.—"Demand for FHA mortgage insurance assistance soared to unprecedented heights during 1958," the agency announced.

"Preliminary summaries of field office reports indicate the largest volume of applications for the insurance of existing-home mortgages and the second highest volume of new-home applications in the 25-year history of the agency," it was stated. "Multifamily rental and cooperative project applications were the highest since 1950.

"As a result, the total FHA application volume in 1958 reached an all-time high of 980,200 units—81% above 1957 and 21% above the previous yearly record of 809,100 units established in 1950."

Compared with 1957, new-home applications increased 72% to 341,700 units, existing-home applications nearly doubled, reaching 546,000 units, and multifamily project receipts rose 37% to 92,500 units.

Total home applications in 1958—887,700 units—were 88% above 1957 and 44% above the previous (1955) high of 618,600 units.

Construction was started under FHA inspection during the year on 295,400 dwelling units—75% more than in 1957 and exceeded only by the 1949 and 1950 volumes. Home properties started with FHA assistance totaled 270,300 units—80% above 1957 and second only to the 1950 record of 328,200 units.

### *It Could Happen Here*

MELBOURNE, Australia—More than 50 persons died in an Australian summer heat wave as temperatures ranged over the 100° F. mark for three days.

At least 20 who died were babies. Press reports said that several infants could have been saved had hospitals been equipped with air conditioning. Citizens were called upon to lend individual air conditioning units to the hospitals.

## *Quick Connect Terminal Standard Issued by NEMA*

NEW YORK CITY—Quick connect terminals, which have been manufactured over the years "in such manner as to cause suppliers and users of automatic temperature controls no end of headaches," may no longer be among the industry's problem devices, says the National Electrical Manufacturers Association.

A change for the better may come about as a result of a new standard issued by the Automatic Temperature Controls Section of NEMA, according to Joseph F. Miller, NEMA's managing director.

The new standard calls for quick connect terminals to be ¼-in. size.

"Also it assures manufacturers of such appliances as electric and gas ranges, room air conditioners, and other heating and cooling equipment in which automatic temperature controls are used that such terminals will provide positive connection, the announcement said.

"In the past both Underwriters' Laboratories, Inc., and industry have questioned this type of terminal because it often resulted in poor connections and customer dissatisfaction.

"Standardization of such terminals is expected to make them more readily acceptable to UL and to industry. Also it will end the confusion and undue expense experienced by suppliers and users of quick connect terminals since they now can gear their production lines to incorporate a product manufactured in accordance with a NEMA standard."

**NOW...A BETTER WAY to control air conditioning!**

For all residential air conditioning with remote condensing units . . . you can do the job better and more simply with these three versatile Penn controls.

RIMSET thermostat . . . with its interchangeable sub-bases . . . handles 12 different cooling and heating jobs. FAN and COOLING CENTERS . . . with their factory-wired internal circuits . . . are compact and save installation time.

For self-contained air conditioning systems, the Penn SYSTEM CENTER electrically interlocks in one unit all cooling-heating functions.

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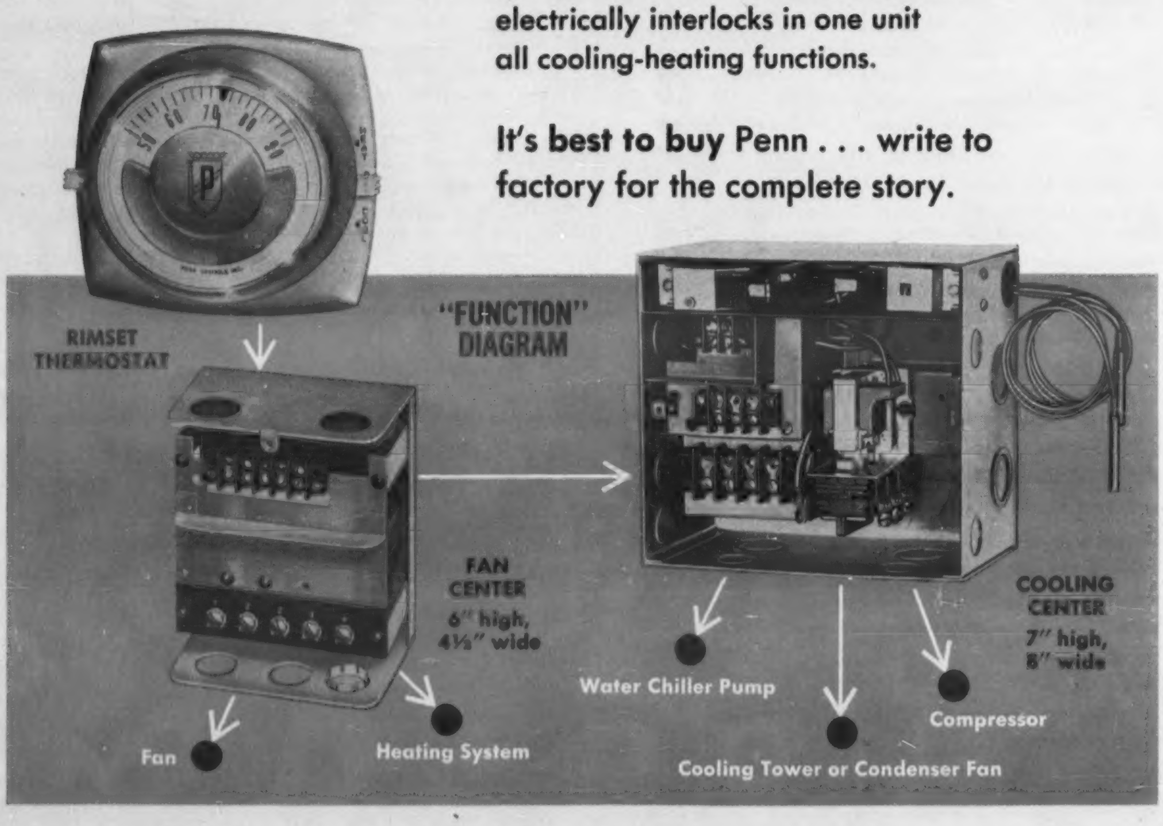

"FUNCTION" DIAGRAM
RIMSET THERMOSTAT
FAN CENTER 6" high, 4½" wide
COOLING CENTER 7" high, 8" wide
Fan
Heating System
Water Chiller Pump
Cooling Tower or Condenser Fan
Compressor

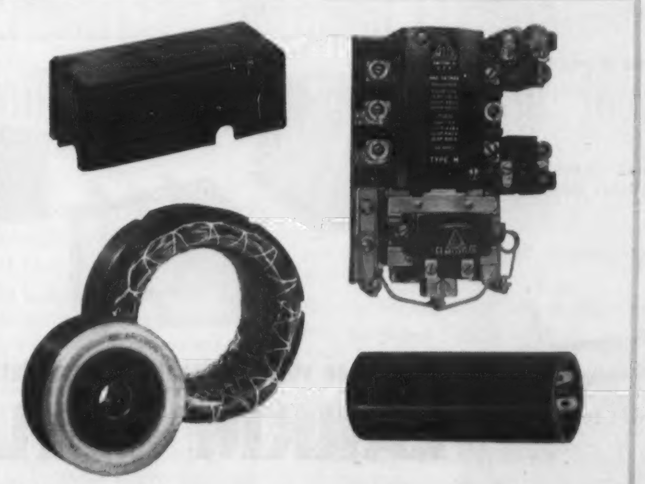
**PENN CONTROLS, INC.** Goshen, Indiana
EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.
AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

# YOU CAN DEPEND ON DELCO FOLLOW-THROUGH

***Delco hermetic motors are backed by customer service representatives trained to stop trouble before it starts***

Spotting trouble before it happens is an important part of Delco's follow-through. Traveling customer service representatives have often made suggestions that have helped customers trim costs and keep production flowing at a steady rate. This extra service is typical of Delco's way of doing things.

All hermetic motors are precision made to your specifications, under a strict quality control system. This is your assurance that the fiftieth or five-hundredth motor you order will be identical to the first—and all of them the best hermetic motors it's possible to produce. Why don't you call your nearby Delco Products Sales Office and see for yourself why Delco motors are so popular with so many users.



*In addition to hermetic motors, Delco makes a wide range of controllers, relays and capacitors for the refrigeration industry.*

GM GENERAL MOTORS

**DELCO MOTORS**

*Delco Products, Division of General Motors, Dayton, Ohio*

- APPLIANCE MOTORS
- INDUSTRIAL MOTORS
- HERMETIC MOTORS AND CONTROLS
- GENERATORS

## Airtemp Reports on Price, Finance Plans

DAYTON—Prices of all 1959 Chrysler Airtemp heating and air conditioning products have been reduced from 1958 levels, Paul M. Augenstein, president, announced recently.

Citing increased sales volume and manufacturing economies as making the reductions possible, Augenstein said:

"This is an across-the-board price lowering designed to make Chrysler Airtemp air conditioning and heating equipment more attractive to our own distribution force and to the consumer.

"It is another step in our campaign to make it easier for people to do business with us."

The reductions affect factory prices to distributors, direct dealers, and Airtemp branch outlets, Augenstein said.

"As is the case with many other manufacturers in this field," Augenstein explained, "we have no suggested list prices on our products. It is the responsibility of each of our distributors to price Chrysler Airtemp products realistically and competitively within his own market."

Augenstein also revealed plans for liberalization of financing arrangements for the firm's wholesale and retail outlets.

"We already are extending the applications of the St. Louis Terminal Warehouse plan to other operations and areas," he said, "thereby making it easier for our distributors to carry representative stocks of Chrysler Airtemp products in inventory.

"We also are expanding corporate assistance to distributors for local financing, both to their dealers and to the final consumers."

## Air Conditioning at Builders' Show--

*(Concluded from Page 1, Col. 2)*

"Total Electric Home" which not only is loaded with electrical conveniences, but also is heated and cooled by electricity. Chris J. Witting, vice president in charge of the company's consumer products group, announced that Westinghouse will spend $2.5 million this year to promote the idea.

• A super-sensitive home heating control system, claimed to be the first to provide instantaneous and continuous modulation of a gas furnace flame completely by electronics was demonstrated by Maxitrol Corp.

A thermistor the size and shape of an automobile fuse detects the slightest change in room temperature and, through an amplifier, operates the power head that modulates the flame, permitting continuous circulation of warm air from the furnace, according to Frank Kern, Jr., president.

• New electric furnaces offering convection type heating were announced by Lennox Industries, Inc. and the Majestic Co. while the Hunter Div. of Robbins & Myers, Inc. exhibited a new forced air electric baseboard system.

• Iron Fireman Co. introduced a new "Custom Mark II" oil furnace that uses a new method of injecting fuel and air into the combustion chamber to provide completely clean burning. The large combustion flow fan located above the fuel injection unit draws, rather than blows, air through the combustion chamber. Positive mechanical draft under precise control makes the furnace independent of varying chimney conditions.

WESTINGHOUSE showed a full scale wall panel that heated and cooled thermoelectrically and provided electroluminescent lighting. This is years away from practical application, however. Chris J. Witting, vice president in charge of the consumer products group, demonstrates the new device.

### Remote Type Air-to-Air Heat Pumps Shown

• New remote type air-to-air heat pumps were exhibited to builders by Revco, Inc. and Frigidaire Div., General Motors Corp.

• A wall-mounted air purifier unit, with circulating fan, was shown by Ductless Hood Co., Inc.

• New residential air conditioner that permits easy switching of blower and cooling coil to permit either upflow or downflow operation was shown by Williamson Co. Bryant Mfg. Co. displayed a new condensing unit featuring a "mixed flow" blower that draws air through the condenser coil and discharges it vertically through a top grille.

### 'House of Ease' Program

• A nationwide program to introduce aluminum "House of Ease" projects in 160 cities was announced by David P. Reynolds, executive vice president of Reynolds Metals Co. Reynolds expects to spend $2.5 million this year to promote the project.

Under the program, builders offer a package of 20 to 30 aluminum building products which save the home buyer up to $5,000 over a 30-year period and drastically cut heating and air conditioning costs.

Because of aluminum's thermal properties, houses equipped with aluminum roofing, siding, insulation, and ductwork are cooler in summer and warmer in winter, Reynolds claims.

Tests indicate that aluminum roofing cuts air conditioning costs by as much as 25% and aluminum ductwork delivers 15% more heat, Reynolds told the builders.

• John Norris, president of Lennox Industries, Inc., announced that his company is launching, in conjunction with American Air Filter Co., Inc. a research program to determine how damaging are the contaminants—if any—that are left in the air after electrostatic filtering.

"If any of these contaminants are discovered following this type of air filtering," he said, "it will be a simple matter to remove them."

Picture coverage of these and other new products exhibited at the Builders Show will appear in a later issue of the NEWS.

LARKIN

the complete quality line of refrigeration and air conditioning equipment

LOW TEMPERATURE HUMI-TEMP UNITS — HOT GAS OR ELECTRIC AUTOMATIC DEFROST

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# November Sales of Room Air Conditioners Beat Same 1957 Month In Several Areas

DETROIT—November was a better month for room air conditioner sales in 1958 than in 1957 in several areas, utility and association reports indicate.

In most places, however, sales for the first 11 months still lagged behind 1957, though the gap was closing.

Electric Institute of Washington reported 1,475 air conditioners sold there by distributors during November as compared with 86 a year earlier. For the 11 months, 1958's 22,209 sales figure was running only a nose behind the 22,719 sold in 1957.

D. C. distributors also sold 25 dehumidifiers in November as compared with 16 in November, 1957. For the 11 months they sold 6,174 dehumidifiers, nearly double the 3,518 sold in 1957.

Distributors shipped 46% more air conditioners to dealers in the Union Electric Co. territory at St. Louis in November than a year earlier. Unit figures were 270 as compared with 185. There, sales were running 16% ahead of 1957 for the 11 months, the comparative figures being 18,996 and 16,361.

The Bureau of Home Appliances of San Diego County, Calif., gave no figures in its year-end report, but said "air conditioning, now coming into public acceptance here, was running far ahead of the previous year's figures."

Electrical Association of Philadelphia reported that, even after considering return of units sold on consignment in previous months, November distributor sales netted 157 units as compared with 89 in 1957. Sales for the 11 months totaled 42,531 units, not too far behind the 45,371 sold in 1957.

Electric Power Board of Chattanooga recorded only 10 air conditioner sales (five of them central units) as compared with 12 in November, 1957. In addition, it recorded six heat pump sales, the same number as last year. Dealers sold six electric furnaces, two more than last year, and installed all in air conditioning systems.

The 11 commercial air conditioning units sold there equalled the number sold last year, but their dollar value was about 25% less.

November sales in the West Penn Power Co. territory in southwestern Pennsylvania numbered only 13 units as compared with 27 last year. Sales for the 11 months dragged at 1,935 as compared with 2,441 in 1957.

Florida Power & Light Co., just issuing its report on October sales, said air conditioners led the parade with a whopping 227% increase over October, 1957. Dealers in its territory sold 5,051 units during the month as compared with only 1,546 a year earlier.

For the first 10 months, they racked up 54,363 unit sales as compared with 43,598 in the same period of 1957.

# Lauer Retires As Chairman of Board at York

YORK, Pa.—After nearly 48 years of continuous service with the present company and its predecessors, Stewart E. Lauer has announced his retirement as chairman of the board of York Corp., a subsidiary of Borg-Warner Corp., and also as chairman of the supervisory board of the York Div. of Borg-Warner.

Lauer said that although his retirement was effective Jan. 1, 1959, he will make his services available on a consulting basis whenever his past experience in York operations can be of assistance.

Lauer's executive career began in 1930 when he was elected vice president and general sales manager of what was then the York Ice Machinery Corp. After ten years of service in this post he was elected president of the same company and continued in this position for a period of 17 years, through 1956.

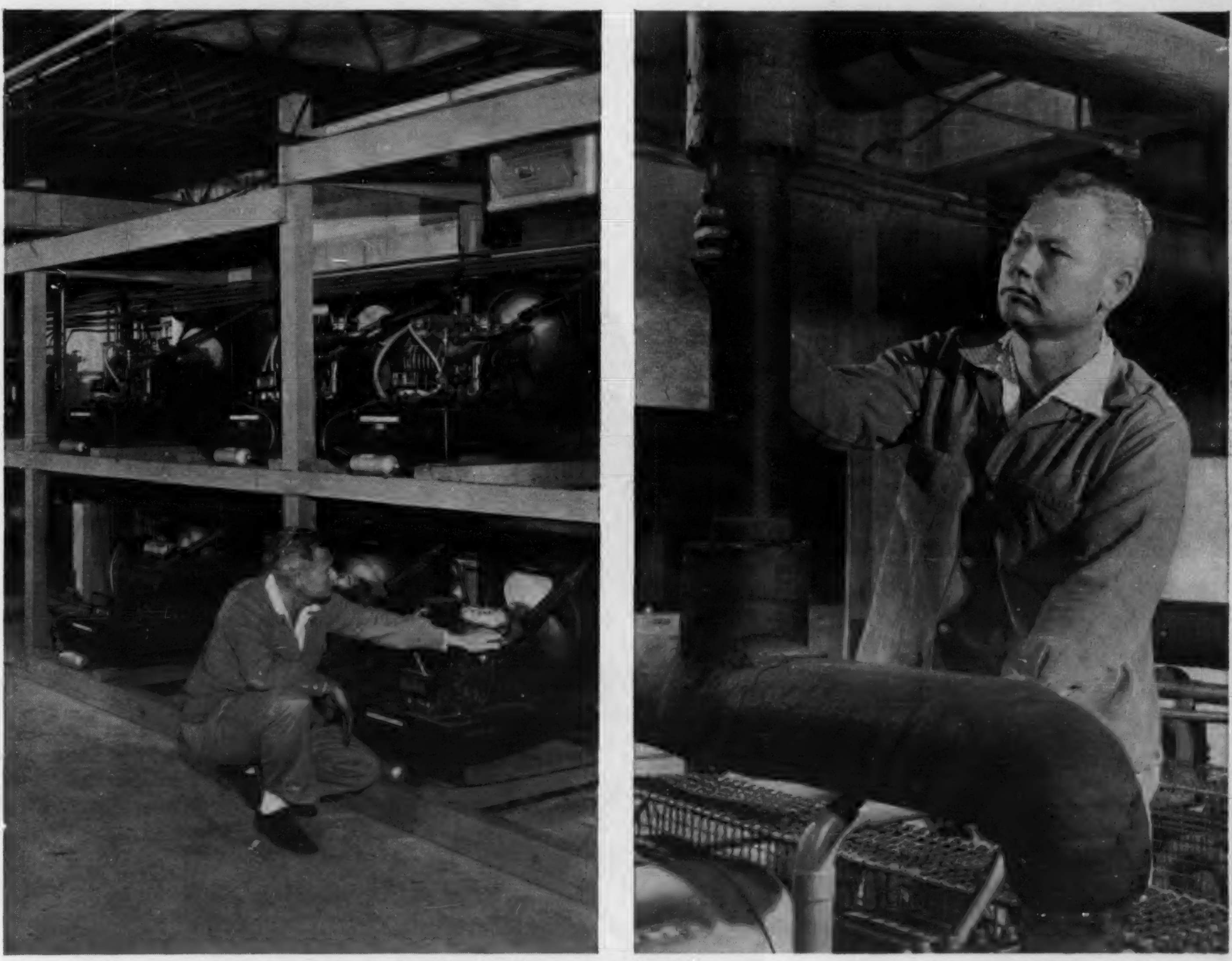
This included the successor company, York Corp., and subsequently the York Div. of Borg-Warner.

During this 27-year period the company's sales volume increased more than 500% while total employment increased more than 150%, it was noted.

During his term as president, Lauer was deeply interested in employe-employer relations and company records show that not a single man day was lost because of unresolved grievances or other labor difficulties, it was also pointed out.

Lauer has been active in York civic affairs and played an important role in trade association activities including the Air-Conditioning & Refrigeration Institute and its predecessors, the National Association of Manufacturers and the Machinery & Allied Products Institute.

**REPRINTS**
**SELLING FOR PROFIT.**
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.



Mr. Crosson points to 1⅛" American VE's used on small compressors that service meat boxes, etc., and 2⅛" American VE's installed in suction and discharge lines of air conditioning units employing Freon 12, at Winn-Dixie food market—Kwik-Chek—in Sulphur Springs, Fla.

"American Vibration Eliminators have been good for millions of vibrations on our jobs—with no failures"

says James Crosson, Refrigeration Service Manager, Winn-Dixie food market chain, Tampa, Florida

"People would walk out of our food markets if the air conditioning broke down—and chances are they wouldn't come back. So we really *depend* on American VE's.

"In the 8 years we've used them, they've been good for millions of vibrations—with no failures reported and no maintenance needed. Without American VE's, we would have had solder joints breaking, loss of refrigerants, and other costly breakdowns."

YOU CAN USE AMERICAN VE'S WITH CONFIDENCE BECAUSE—

**The right metal does the job.** The special tin-bronze alloy—the result of American Brass metallurgical know-how—is tailored for the refrigeration and air conditioning industries.

**Double bronze braid where extra protection is needed.** On all American VE's 2⅝" O.D. or larger. Neoprene latex-covered Vibration Eliminators are available for use when danger exists from condensed moisture on the outside of the VE.

**Clean, dry, tested, protected.** Snip the end of the vaporproof polyethylene bag and you have a factory-fresh unit to install in the line . . . clean, inside and out!

**Packaged for your convenience, protection.** The new boxes are sturdy, easy to open, easy to identify. No confusion or fumbling.

**Listed by Underwriters' Laboratories through sizes 3⅝" O.D.**

For descriptive folder write: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

[illegible] Rev.

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AMERICAN

FOR AMERICAN VIBRATION ELIMINATORS SEE YOUR

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DISTRIBUTOR

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**Air Conditioning Department, General Electric Company**

BE SURE TO VISIT
GENERAL ELECTRIC
BOOTH 1068
International Heating and Air Conditioning Exposition

# Air Conditioning

## WHAT WILL SPEED ITS GROWTH?

The boom in air conditioning is bound to come!

The reason is clear. Like the automobile, travel by air, or modern kitchen appliances, air conditioning is *progress*—a means to a better life. The American consumer will always buy progress.

Why, then, hasn't the boom arrived? Because air conditioning hasn't been *sold*. Why hasn't it been sold? Because, in the battle over *price*, the concept of *value to the customer* has been lost.

We at General Electric are not waiting any longer for air conditioning to sell itself. We believe that when the consumer is convinced that the value exceeds the price, he will be satisfied—and air conditioning will gain mass acceptance. The key, therefore, is CUSTOMER SATISFACTION.

With this in view, General Electric presents its dealer program for 1959. This program will show dealers how to assure customer satisfaction—and how to reap big profits from the coming boom in air conditioning.

### Good products!

General Electric's '59 program is based on the finest, most modern air conditioning equipment that money can buy—designed, engineered and manufactured to the same high standards of quality that have made General Electric the unquestioned leader in the major appliance field. There's a General Electric unit or system for every type of residential, commercial and industrial requirement—built to assure CUSTOMER SATISFACTION.

### Good application, installation, service!

An extensive *technical training course* for dealers will be a major part of General Electric's '59 program. Conducted by expert factory personnel, in strategic locations throughout the United States, it will include two semesters, home study and practical work periods. The dealer who conscientiously takes this course will be a top-flight specialist in application, installation and service. He will be ideally equipped to supply CUSTOMER SATISFACTION.

### Good selling!

Realizing the importance of selling in bringing about the boom in air conditioning, G. E. is launching the *General Electric Sales College* for its dealers. Course includes the basic principles of selling—*why people buy—how people buy—how to step up your selling power—how to hire, compensate, train and supervise salesmen—and many more valuable sales lessons.* In addition, *General Electric's '59 Sight-and-Sound Product Presentation* shows dealers the most effective way to present G-E air conditioning benefits to customers. With this combination, General Electric dealers will have the finest, most complete sales-training in the industry. And they'll be selling the products that spell CUSTOMER SATISFACTION.

### Get your share of the coming boom in Air Conditioning

Take the first big step now—get complete information about General Electric's CUSTOMER SATISFACTION Program for '59. See your General Electric air conditioning distributor—or mail coupon today

*Progress Is Our Most Important Product*

**GENERAL ELECTRIC**

Air Conditioning Department, Tyler, Texas.

General Electric Company
Air Conditioning Dept., Tyler, Texas
Attn. Mr. C. B. Ramsdell, Manager—Marketing

ACN120

**Please send me, without obligation, complete information on General Electric's 1959 Customer Satisfaction Program. I am interested in:**

- ☐ Home heating and cooling.
- ☐ Commercial and industrial air conditioning.
- ☐ Both.

Name____________________

Firm____________________

Address____________________

City__________ Zone___ State________

### *Many Uses Seen*

# Cooling Load, Running Time Calculated In 24 Seconds by Westinghouse Computer

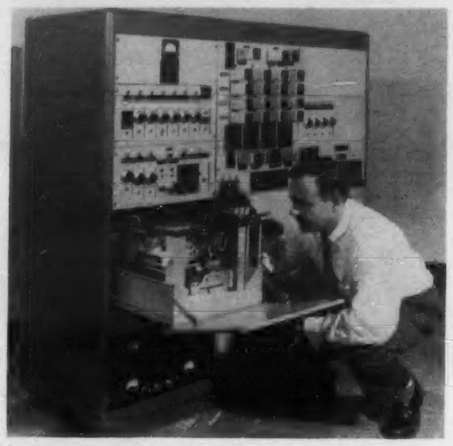


FIG. 1—Westinghouse analog recording air conditioning comupter simulates all important variables that affect the cooling load on an air conditioner. Given the necessary data, it can for a given size of unit predict the temperatures in a house over a 24-hour period and accurately estimate the total running time of the air conditioner.

STAUNTON, Va.—Indoor and outdoor temperature curves and compressor running time during 24 hours can be predicted accurately in 24 seconds by a new electronic computer developed by Westinghouse Electric Corp., according to company officials.

The computer was unveiled at the 14th International Heating & Air Conditioning Exposition in Philadelphia by the Westinghouse Air Conditioning Div.

"This computer presents a new approach to an old industry problem—that of determining and properly specifying how much air conditioning capacity is required in a particular house at a particular location," said Raymond K. Serfass,, manager of the Westinghouse division.

"We intend to use the computer for training purposes so that our salesmen, distributors, and dealers will be better equipped to determine the air conditioning needs of our customers," he explained.

"We do not plan to use it in calculating air conditioning requirements for the individual homeowner at the present time, because its development has not yet progressed to the stage where this would be economically feasible."

"It is likely to find application in major housing projects, however, where many homes are basically similar in construction, but varied in design, size, and orientation — factors which influence the size of the air conditioning unit which should be selected for each home, he added.

"In addition to the applications of primary interest, the computer is capable of proving its versatility in another way: it presents a very useful means of studying what kind of home construction is most economical from an air conditioning point of view," Serfass declared.

The computer was designed and developed at the Westinghouse new products engineering laboratories in Cheswick, Pa., at the request of the company's air conditioning division. The project was carried out by William C. Evans, William L. Wright, and Clyde A. Booker, Jr., under the direction of Dr. R. A. Ramey, manager of the new products engineering department.

Known as Warac to signify "Westinghouse Analog Recording Air Conditioning Computer," the unit is designed to consider systematically over 50 factors which influence the indoor temperature of a house. The information related to these factors is programmed into the machine through a set of dials and switches, explained Carl Cannon, training director.

### Computer Principle Explained

The principle behind the analog computer's operation is that voltage represents temperature, and current is equated to the flow or transfer of heat. Capacitors serve to denote the storage of heat energy; resistors are comparable to thermal resistance.

Four basic components make up the computer: the generator section, analog section, amplifier section, and recorder.

In the generator section of the computer, a knob is preset to indicate the effect of the sun's rays upon the house. In order to provide the computer with this information, the time of year and the latitude of the location must be known. Another dial is used to set the direction in which the house faces. A control for outdoor air temperature is also included in the generator section.

In the analog section, factors taken into consideration include the type of structure of the house as represented by the windows, floors, walls, ceiling, and roof. Other variables accounted for are: amount of insulation, shading on the exterior walls, wind velocity, ventilation loads, average occupancy, heat generating from cooking meals, etc.

The amplifier section has controls to set up the exact area in square feet of walls, floors, ceiling, and glass. Here also is a dial for indicating the desired indoor temperature.

### Switch Set for Air or Water-Cooled

Once all of these adjustments have been made the operator selects an air conditioning unit in terms of cooling capacity anywhere from 0 to 110,000 B.t.u. Then a switch is set for either air-cooled or water-cooled unit ratings.

*(Concluded on Page 10, Col. 1)*

**"Corrosion." By Frank J. Versagi—50¢ each.**

**Get your copy** Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

THE PEOPLE WHO KNOW REFRIGERATION BEST

DEPEND ON THE PEOPLE WHO KNOW TUBING BEST!

HE TAKES YOUR TUBING PROBLEMS TO THE CLEANERS!

Every foot of GM Steel Tubing takes shape right here under the watchful eye of Dick Spears and his staff. Among other things, they supervise the steam cleaning of every steel strip from which GM Steel Tubing is formed. Then cleanliness is safeguarded by keeping these strips free of outside contaminants. In addition, the atmosphere in which the tubing is annealed is controlled to assure specified ductility requirements. Extra work? Sure it is. But Dick enjoys every minute of it. He knows that when his job is done he has helped produce the cleanest tubing you can buy. Put some on test today. See why GM Steel Tubing leads in refrigeration sales . . . by miles. *Rochester Products Division of General Motors, Rochester, New York.*

SEE SWEET'S CATALOG 1a/Ro

GM STEEL TUBING BY ROCHESTER PRODUCTS

RP

AMERICA'S LARGEST MANUFACTURER OF REFRIGERATION TUBING

ACME APPLIANCES
AUTHORIZED CHRYSLER AIRTEMP DEALER
FORWARD
LOOK
CHRYSLER AIRTEMP

**CHRYSLER**
**AIRTEMP**

# means business... BIG business for you in 1959!

And to prove it, we're pulling out all the stops.
In February, we're introducing:

**New high-styled, high-powered line**
. . . including the first room air conditioners that THINK!

**New fabulous incentive plan**
. . . including free trips to Paris and Rome for Chrysler Airtemp dealers and distributors!

**New full-color national advertising**
. . . plus special promotion packages and co-op advertising!

**New competitive prices**
. . . leading the way to greater sales and better profits for franchised Airtemp dealers!

Watch for the complete story in the February 9th issue. After you've read it, you'll know why Chrysler Airtemp means business—BIG business—in 1959! If you can't wait, see your local Airtemp distributor now. Or write Airtemp Division, Chrysler Corporation, Dept. H-19B, Dayton 1, Ohio.

## Computer--

*(Concluded from Page 8, Col. 5)*

A push of a button puts the computer into operation. In 24 seconds its recorder feeds out a strip of tape containing a chart with a record of the actual outdoor temperatures for the house under consideration over a 24-hour period.

This tape indicates exactly how an air conditioning unit will perform in cooling the home in question, and by varying the factors which have been set on the dials, much valuable information may be learned, according to Cannon.

By turning up the dial which controls the occupancy of the house, for example, it can be ascertained what temperature the air conditioning unit will maintain while a number of guests are present for a party. It is also possible to determine what effects additional insulation would have upon the cooling requirements of a home.

### Computer Used on Staunton Test House

The computer has been used on a "test house" at Staunton using floor plans and construction factors. Several tapes have been run off selecting different size cooling units, changing the house orientation, adding or subtracting insulation, imposing abnormal loads of people and other variables to demonstrate the new computer's ability to evaluate all these changes.

Evaluations such as these would take months to accumulate on recording thermometers, Cannon points out.

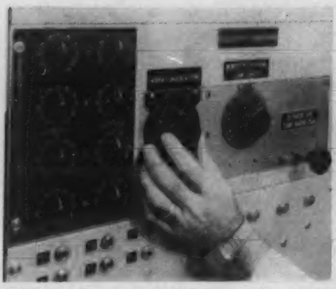


FIG. 2—The source of any air conditioner load—heat— is generated in the form of electrical signals in the generator section of the analog load computer. In this section, a series of eccentric cams trace the variations of solar effect on a house as determined by a particular month, latitude, and geographical location. Cam followers linked to potentiometers produce the electrical signals.

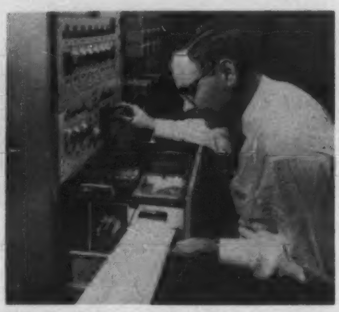


FIG. 3—Output of WARAC is a continuous recording chart, studied here by Carl Cannon, showing how, for the given size of air conditioner, the temperature inside the residence will vary over a 24-hour period contrasting it to the outdoor temperature. In addition, the tape record shows the total running time of the air conditioner in the simulated home during that period.

In order to verify the accuracy of the computer Westinghouse for the past summer season selected several typical residences in different parts of the country and instrumented these homes with continuous eight-point temperature recorders. Results of these field tests validate the findings and accuracy of the computer, Cannon says.

Westinghouse is already beginning to take advantage of the computer's new approach in that part of the merchandising program for 1959 is a correspondence training course in application engineering. Students will be asked to figure typical residential loads by use of conventional forms.

Examples of these same house plans then will be analyzed on the computer for comparative accuracy, estimate of temperatures anticipated, running time, and similar measures of performance.

## 3 Detroit Firms Merge Into Air Streams, Inc.

LOUISVILLE, Ky. — A new Detroit manufacturer's agency, Air Streams, Inc., has been formed by a merger of three Detroit firms, it was announced here.

The new organization will market American Air Filter Co.'s air filter, dust control, heating and ventilating, air conditioning, and engine and compressor products, as well as its Illinois Engineering specialties.

All employes of Saunders & Co., Earl W. Graham, and American Air Filter's Detroit branch office will make up the personnel of Air Systems.

Al Saunders has been named president of the new firm; Charles Trambauer, vice president; Earl W. Graham, vice president and secretary; and Ken Wagoner, vice president and treasurer. Wagoner formerly was associated with the Trane Co. in Detroit.

Air Systems will be located at 18263 N. McNichols Rd., Detroit 19.

## Ray Kromer & Associates Formed by Former RACCA Executive Sec.

CLEVELAND—Ray Kromer, former executive vice president of Refrigeration & Air Conditioning Contractors Association (national), has established offices here as manufacturers' representative and public and labor relations adviser.

The firm, under the name of Ray Kromer & Associates, has established offices at 16491 Northvale Blvd., Cleveland Heights, Ohio.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

**WOLVERINE LONG LENGTH COILS ARE LONG ON SAVINGS**

Manufacturing refrigerators, air conditioning units or, for that matter, anything requiring copper tubing?

If you are you can save time, money and space simply by specifying Wolverine Tube's long length bunch or level wound coils.

Level wound coils are ideal for continuous feeding of automatic equipment. (For example, the illustration in this advertisement, shows the quantity production of return bends.) Level wound coils permit high speed unwinding without the danger of the tubing becoming snarled or tangled. They often eliminate the necessity of standby operators. Both level wound and bunch coils provide greater inventory flexibility resulting in production economies as well as substantial savings in floor space requirements.

Why not get complete information about savings made possible by these Wolverine products! This advertisement attached to your letterhead will bring competent counsel from Wolverine. Mail it—TODAY!

CALUMET & HECLA, INC.
CALUMET DIVISION
URANIUM DIVISION
GOODMAN LUMBER DIVISION
WOLVERINE TUBE DIVISION
In Canada:
CALUMET & HECLA OF CANADA LIMITED
WOLVERINE TUBE DIVISION
CANADA VULCANIZER & EQUIPMENT CO. LTD.
UNIFIN TUBE DIVISION

WOLVERINE TUBE
DIVISION OF
CALUMET & HECLA, INC.
17246 Southfield Road
Allen Park, Michigan
Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA.
SALES OFFICES IN PRINCIPAL CITIES

*See Wolverine's exhibit at the 14th International Heating and Air Conditioning Exposition, Philadelphia, Pa., January 26-29.*

DIVISIONAL SALES MANAGER OPENINGS-
New England, East Coast and Middle West
with
Large Manufacturer of Commercial Refrigeration, contacting distributors and chain accounts.

Salary, expenses, incentive plan and other benefits.

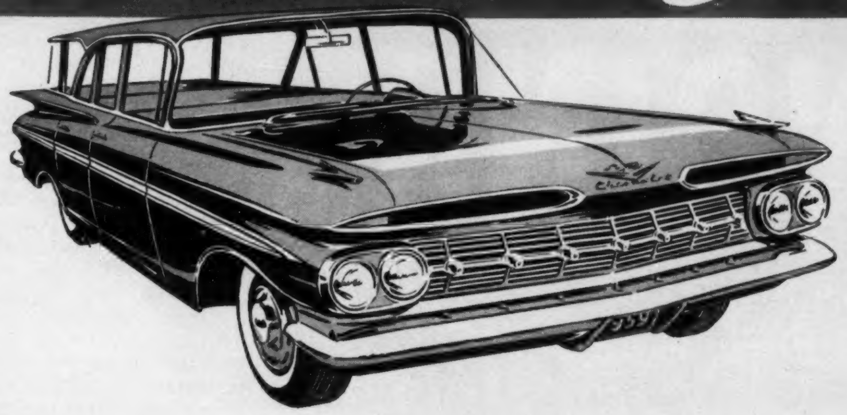
Please state age, past experience and include recent photograph.

Write to Box A6161
Air Conditioning, Heating & Refrigeration News
450 West Fort Street
Detroit 26, Michigan

# $20,000.00 IN PRIZES

# FREON® "PARTNERS IN PROFIT" CONTEST

## 1ST PRIZE CHEVROLET STATION WAGON!



**1959 Kingswood with air conditioning, air suspension, power steering, radio, heater, automatic transmission . . . fully equipped . . . $4,000**

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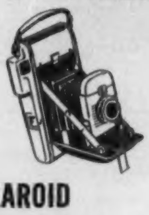
| | |  | |
| $1,000 UNITED STATES SAVINGS BONDS | RCA VICTOR "MARK 21" COLOR TV worth $495 each | POLAROID "HIGHLANDER" CAMERAS worth $72.75 each | WESTINGHOUSE TRANSISTOR PORTABLE RADIOS worth $39.95 each |

## –284 CHANCES TO WIN!

## Hints to help you win

Your complete air conditioning and refrigeration wholesaler is *your* partner in profit. It will pay you to know and use his services, cultivate his friendship. Here are some of the benefits you get by dealing through your wholesaler.

- **Convenience** of buying at a one-stop supply source. Your wholesaler keeps ample, diversified stocks of high-quality air conditioning and refrigeration parts, equipment and supplies.
- **Immediate delivery** by your wholesaler permits you to give prompt, dependable service—imperative in emergencies.
- **Cost savings** because your wholesaler assumes expenses of inventory, warehousing, shipping, accounting and insurance.
- **Expert technical and engineering help** when you want it. Your wholesaler assists with design problems, figuring material costs; gives catalog service, prices and up-to-date information on new products.

## "Freon" Check List

Look for this list of premium qualities of "Freon" refrigerants on your official entry blank. Check the one you consider most important.

☐ Time-tested—over 27 years in use—you can't go wrong with "Freon."
☐ Stable, pure and dry.
☐ Factory-sealed for purity.
☐ Nontoxic, nonflammable.
☐ Always available—anywhere in the world.
☐ Made by Du Pont—backed by years of technical and manufacturing leadership.

**Insist on genuine "FREON"—Premium Quality Refrigerants . . . in the cylinders with the gold-hood caps.**

DU PONT
Better Things for Better Living
. . . through Chemistry

**"FREON" PRODUCTS DIVISION**
E. I. DU PONT DE NEMOURS & CO. (INC.)
WILMINGTON 98, DELAWARE

*Freon and combinations of Freon- and F-followed by numerals are Du Pont's registered trademarks for its fluorinated hydrocarbon refrigerants.

**CONTRACTORS, SERVICE MEN** . . . You are eligible to win an air-conditioned 1959 Chevrolet station wagon if your company has bought Freon* refrigerants from a complete air conditioning and refrigeration wholesaler within the contest period (January 26, 1959—May 15, 1959). Read over the simple rules and hints to help you win. Then just tell us why *you* think it's good business to deal with a *complete air conditioning and refrigeration wholesaler*. It's easy! Enter often! You can get official entry blanks through your wholesaler. Ask him about the Freon® "Partners in Profit" Contest *today*.

### SIMPLE CONTEST RULES:

**1.** Contest is open to all firms and their employees who are customers of complete air conditioning and refrigeration wholesalers providing that the customer firm purchases "Freon" refrigerants from a complete air conditioning and refrigeration wholesaler during the contest period (January 26, 1959 to May 15, 1959). Employees of E. I. du Pont de Nemours & Co., its subsidiaries, its agencies or its wholesale distributors of "Freon" refrigerants are not eligible to enter the contest.

**2.** Check the quality of "Freon" most important to you.

**3.** Complete this statement in 35 *additional* words or less: "I believe it is good business to deal through a complete air conditioning and refrigeration wholesaler because . . .

Mail your entry to: **FREON® CONTEST, Box 22F**
**Mount Vernon 10, New York**

Entries must be postmarked by May 15, 1959, and received by us at least within eight days of this date.

**4.** You may enter as often as you like. Your entry must be your own original work and must be submitted in your own name, on an official entry blank, obtainable through your complete air conditioning and refrigeration wholesaler.

**5.** Prizes awarded by Reuben H. Donnelley Corp., on the basis of their judgment regarding originality, sincerity and aptness of thought. Duplicate prizes awarded in case of tie.

**6.** Judges' decisions are final. All entries and ideas become the property of E. I. du Pont de Nemours & Co. (Inc.). None will be returned. Contest is subject to federal, state, and local regulations.

**7.** Winners will be notified about six weeks after close of contest.

**See the big prizes on display at the ASHAE show, Philadelphia. Visit the "FREON" refrigerants booth and enter the contest!**

# 'Heat Gain Calculator'

## *Operoting on the Slide Rule Principle It Gives Instantaneous Heat Gain Per Sq. Ft. of Window Area*

HEAT gain calculator developed by the Research Dept. of Libbey-Owens-Ford Glass Co. is a new slide rule for architects and engineers, particularly useful for estimating air conditioning requirements. Here Henry F. Moyer, group leader in product research, explains use of the calculator.

TOLEDO—A tool for architects and engineers who determine air conditioning loads is the new "Heat Gain Calculator" on the slide rule principle developed by the research department of Libbey-Owens-Ford Glass Co.

The new calculator will provide the instantaneous heat gain in B.t.u. per hour per square foot of window area due to directly transmitted solar and sky radiation plus the energy admitted to the room after absorption in the glass of both sun and sky radiation, it was explained by O. R. Wenzler, technical service manager for Libbey-Owens-Ford and himself a registered architect.

"It does not require special skill nor a technical background to use this heat gain calculator," said Wenzler. "One may become quite proficient in its use after about a half-hour's practice using instructions printed on the calculator."

Actually the calculator has two separate scales. One produces the heat gain values at certain latitudes, for certain dates and hours of the day, and six different types of window glazing. The other provides the factors for convected and conducted heat gain due to temperature difference between outside and inside temperatures.

Heat gain values in the calculator are based largely on material published by the American Society of Heating & Air-Conditioning Engineers in the ASHAE Guide and Research Reports.

"There are two slides for the calculator, each printed on both sides," it was explained. "They carry data for definite dates. The orientation of the window, and the hour of the day also constitute factors to set on the slide. Seven latitudes are used and easy interpolation may be made to provide accurate data for all locations in the United States.

"Typical dates used on the slides are June 21, May 21 and July 23, April 20 and Aug. 24, and March 21 and Sept. 23.

"The values are produced for six different types of glazing—double strength window glass, quarter-inch polished plate glass, quarter-inch Heat Absorbing plate glass or Parallel-O-Grey, Thermopane made with double strength window glass, Thermopane made with two lights of quarter-inch plate glass separated by a half-inch air space, and Thermopane made with quarter-inch Heat Absorbing plate or Parallel-O-Grey."

In addition to providing a rapid method of calculating the heat input through windows for given conditions, the heat gain calculator has a very important use in computing the reduction in air conditioning equipment which may be achieved by using different types of Libbey-Owens-Ford glass developed for resisting the inflow of sun heat, it was stated.

An example is given for an office building at Tucson, Ariz., 32° North latitude with glass areas of 20,000 sq. ft. on the north side, 25,000 sq. ft. on the south side, 15,000 sq. ft. on the east side, and 10,000 sq. ft. on the west side.

"From the calculator it may be found that this building will have a peak solar heat gain due to glass at 10 a.m. on March 21 and Sept. 23," the announcement said.

"Then, assuming that the outdoor temperature is 85° F. and the air in the building to be maintained at 75° F., it may be computed from the calculator that the total heat gain using regular plate glass will be 5,937,000 B.t.u. per hour. But heat gain for Heat Absorbing Thermopane computes to 3,412,000 B.t.u. per hour.

"Thus the reduction by the use of Heat Absorbing Thermopane is equal to 2,525,000 B.t.u. per hour and since 12,000 B.t.u. per hour represents one ton of refrigeration load, this saving in air conditioning load achieved with the heat absorbing glass would be 210 tons for the building.

"The heat gain for an entire building or a single window may be computed with the new heat gain calculator."

Copies have been placed in the hands of field representatives of Libbey-Owens-Ford Glass Co. who are showing them to interested architects and engineers.

A nominal charge of 50 cents is being made for the calculator, according to the firm.

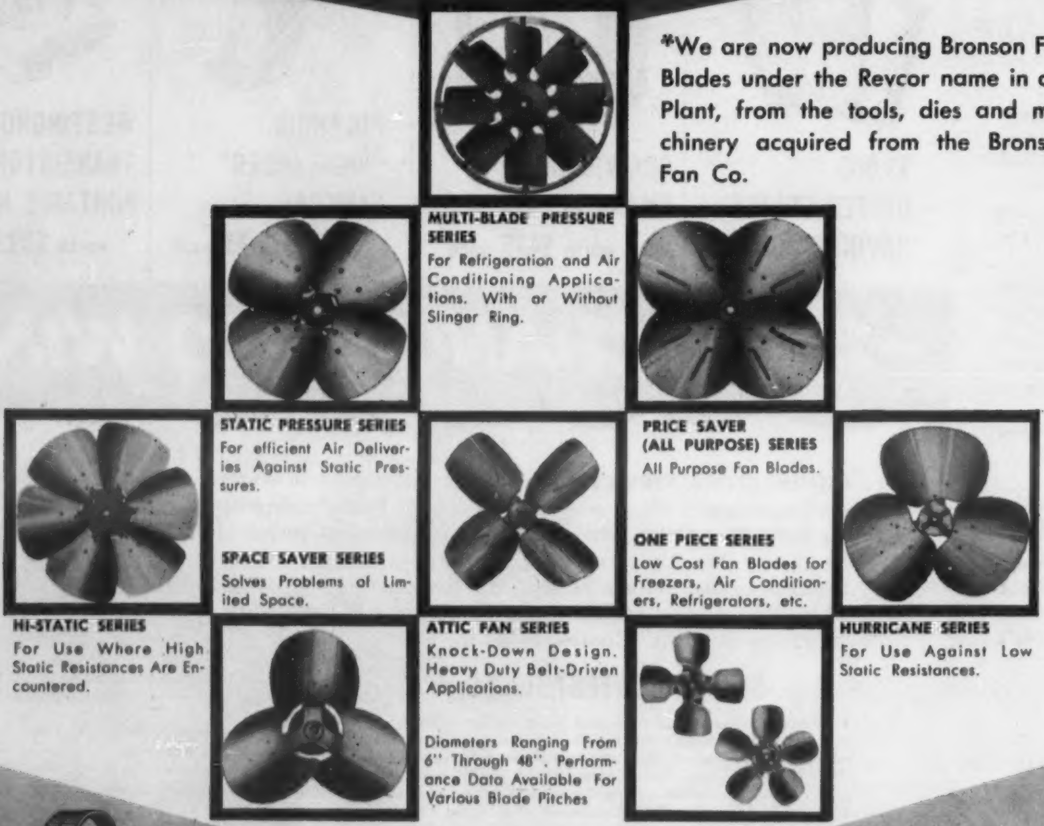
## York Marine Sales Dept. To Meet Jan. 26, 27 In Philadelphia

YORK, Pa. — A meeting of the Marine Sales Dept. of the York Div., Borg-Warner Corp., has been set for Jan. 26 and 27 in Philadelphia, according to M. S. Lebair, assistant vice president.

To be held in connection with the International Heating & Air Conditioning Exposition at which many York products will be displayed, the meeting will take up sales programs and products for 1959. Particular stress will be placed on the application of York air conditioning and refrigeration to Navy and marine vessels, according to the firm.

ANNOUNCING
the acquisition* of the
BRONSON FAN BLADE LINE
by Revcor inc.

*We are now producing Bronson Fan Blades under the Revcor name in our Plant, from the tools, dies and machinery acquired from the Bronson Fan Co.



**MULTI-BLADE PRESSURE SERIES**
For Refrigeration and Air Conditioning Applications. With or Without Slinger Ring.

**STATIC PRESSURE SERIES**
For efficient Air Deliveries Against Static Pressures.

**PRICE SAVER (ALL PURPOSE) SERIES**
All Purpose Fan Blades.

**SPACE SAVER SERIES**
Solves Problems of Limited Space.

**ONE PIECE SERIES**
Low Cost Fan Blades for Freezers, Air Conditioners, Refrigerators, etc.

**HI-STATIC SERIES**
For Use Where High Static Resistances Are Encountered.

**ATTIC FAN SERIES**
Knock-Down Design. Heavy Duty Belt-Driven Applications.

**HURRICANE SERIES**
For Use Against Low Static Resistances.

Diameters Ranging From 6'' Through 48''. Performance Data Available For Various Blade Pitches

BLOWER WHEELS
FAN BLADES
WHEEL HOUSINGS
INLET RINGS .

now Revcor makes all 4

**AVAILABLE:** TECHNICAL DATA THAT WILL HELP KEEP YOU UP TO DATE ON THE LATEST DEVELOPMENTS IN THE AIR IMPELLER FIELD! Let us put your name on our mailing list for this current and forthcoming important and useful material. No cost or obligation of course. Simply write to us on your Company letterhead.

Revcor INC., 251 EDWARDS STREET CARPENTERSVILLE, ILLINOIS

# LOOK INSIDE....

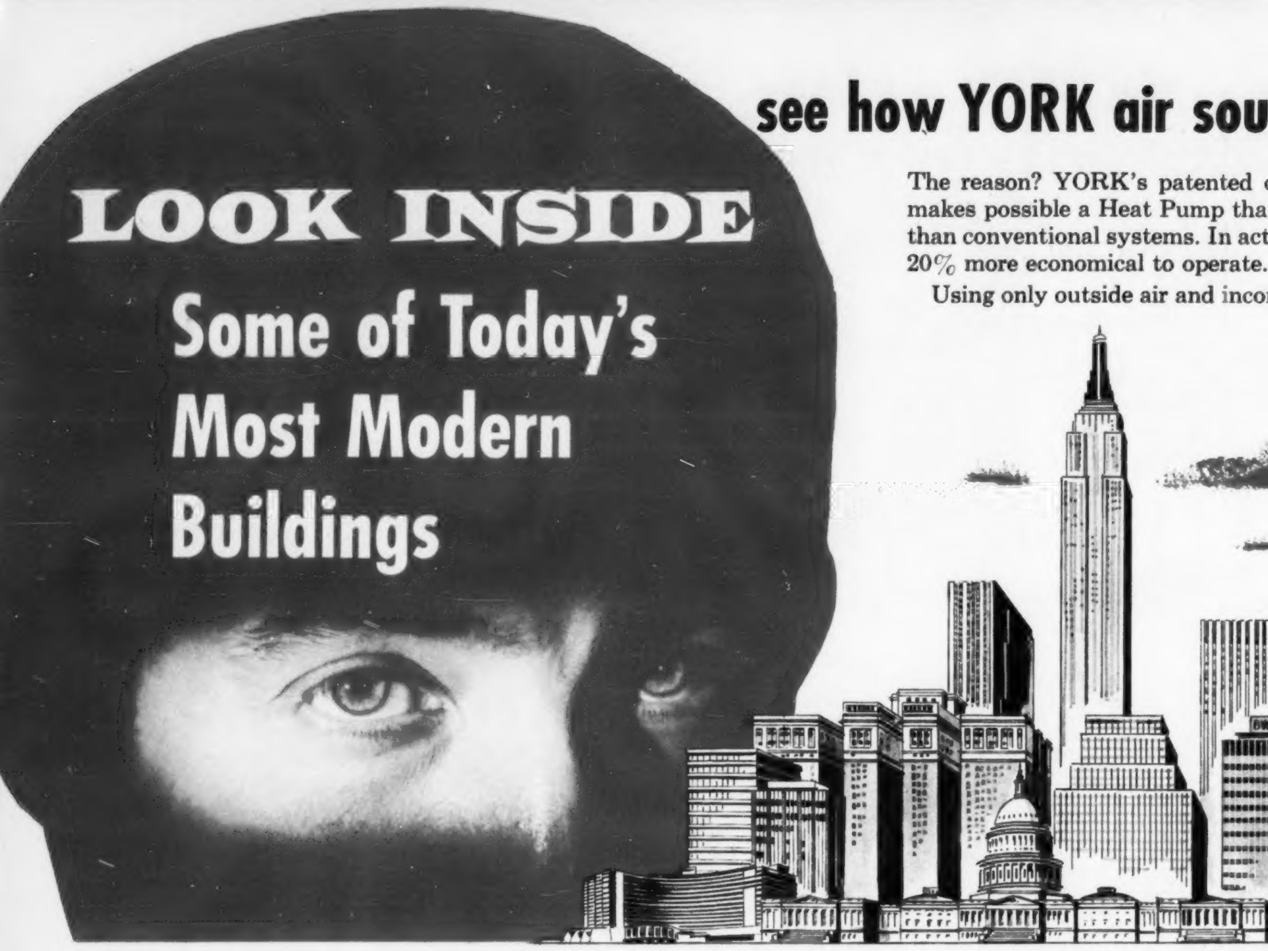
SEE HOW YORK BORG-WARNER

CREATIVE PRODUCT ENGINEERING FOR COMFORT

NOW BRINGS YOU THE FOUR
BIG FORWARD STEPS IN
AIR CONDITIONING AND HEATING

## see how YORK air sou

The reason? YORK's patented c
makes possible a Heat Pump tha
than conventional systems. In act
20% more economical to operate.
Using only outside air and inco



## LOOK INSIDE

**YORK's exclusive compound-compression desig
makes Heat Pumps practical even in northern c**

- **OPERATES EFFECTIVELY AT SUB-FREEZING TEMPERATURES**
- **FROM 42% TO 67% MORE HEAT FOR THE SAME POWER**
- **ELIMINATES COSTLY, SUPPLEMENTARY STRIP HEATING**

**More YORK Central Station Air-Source Heat Pumps Have
Been Specified Than Those Of All Other Manufacturers!**

# ource Heat Pumps out-perform conventional systems!

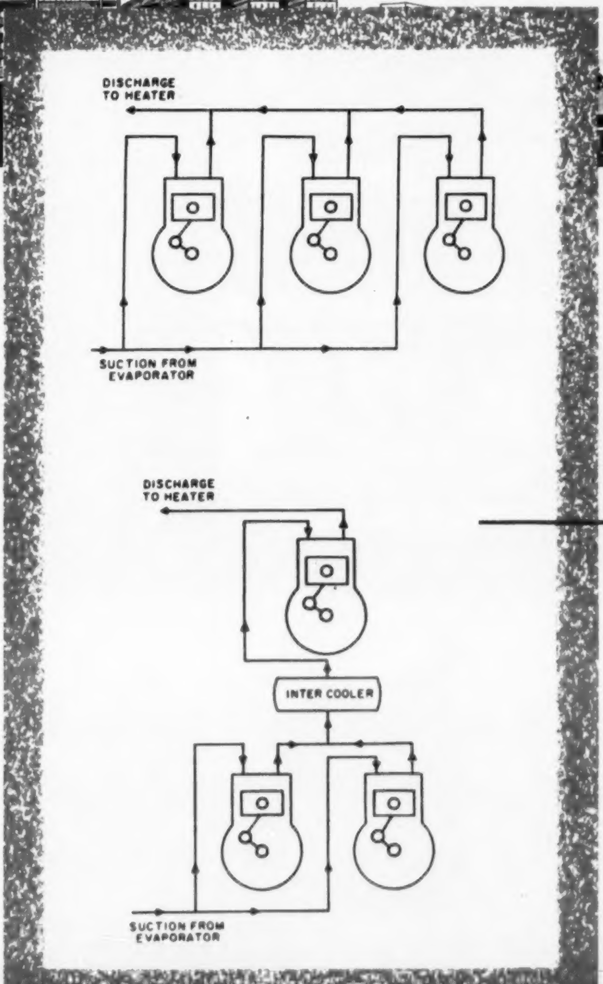
ted compound-compression design
that delivers more Btu's per watt
n actual installations, it has proved
rate.

incoming power lines (no coal, gas, oil or supplementary electric heaters are needed) a YORK Heat Pump maintains year-round comfort conditions in commercial and industrial buildings of all types and sizes—even in areas having winter design temperatures below freezing.

It has all the advantages of separate heating and cooling systems without the disadvantage of costly seasonal shutdowns and start-ups. Space normally provided for boiler rooms, fuel storage facilities and chimneys can be utilized for business profit production.

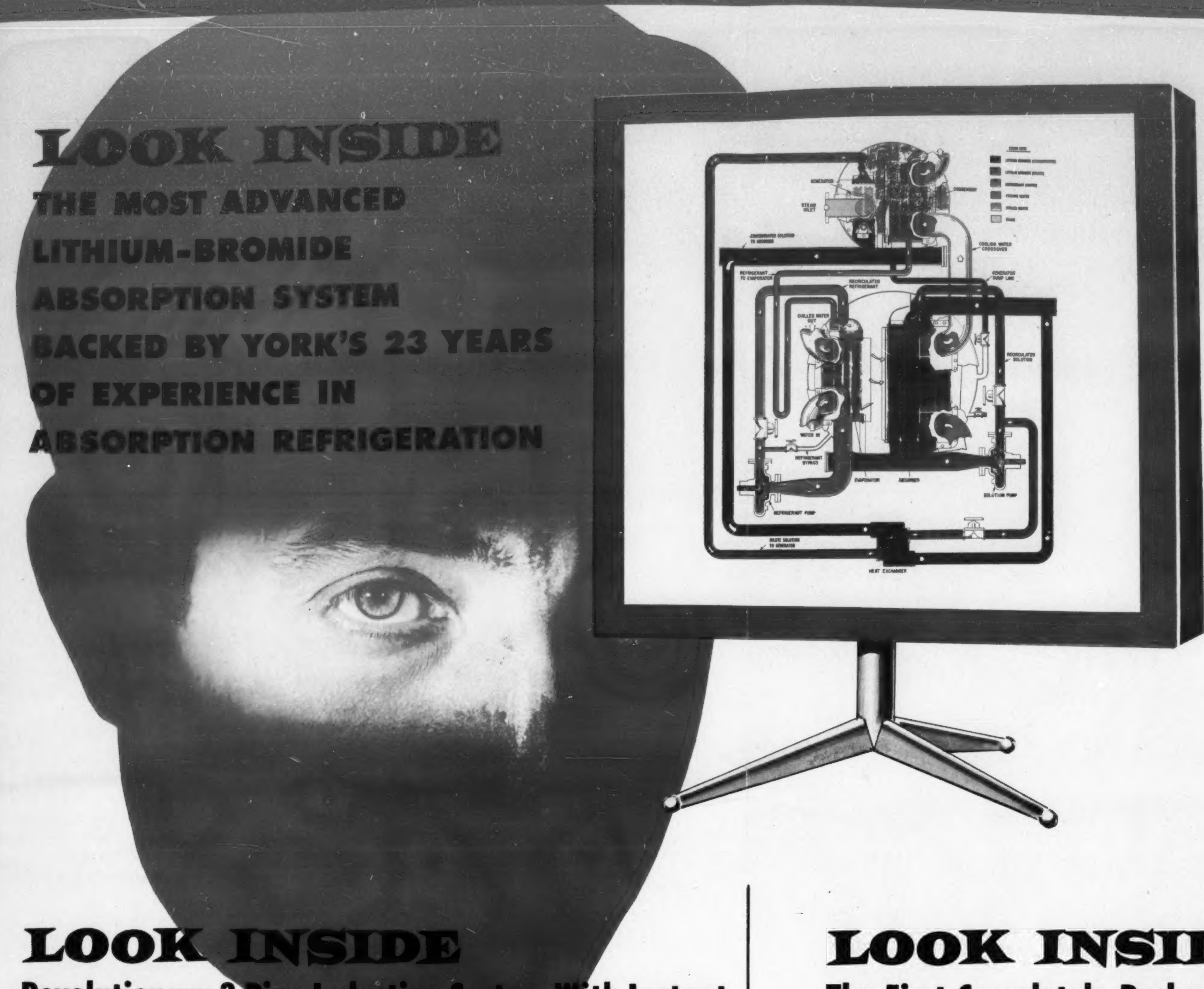
Rapid acceptance of this revolutionary new system is shown by the fact that more YORK Central Station Heat Pumps have been specified than those of all other manufacturers.

## ign
## areas!



**In single-stage compression,** equal amounts of refrigerant are compressed in each cylinder. This method does not provide sufficient heat when outside air temperatures are below 25 or 35 F. Electric heaters must then be used.

**In compound compression,** equal amounts of refrigerant are first compressed in two cylinders. Some heat of compression is withdrawn in an intercooler. All the refrigerant is then compressed in the third cylinder to a higher temperature and pressure. This method provides sufficient heat even during subfreezing weather.



# LOOK INSIDE

## THE MOST ADVANCED LITHIUM-BROMIDE ABSORPTION SYSTEM BACKED BY YORK'S 23 YEARS OF EXPERIENCE IN ABSORPTION REFRIGERATION

You are looking at the latest development in automatic, heat-operated water cooling systems.

Low-pressure steam or high-temperature water is the activating medium. No motor drive, no expensive starters or heavy electrical conduit needed.

Tap water is the refrigerant, lithium bromide the absorbent. Once the system is charged they need never be replaced.

Savings in operation, installation and maintenance are the most important advantages here over motor-driven refrigeration systems.

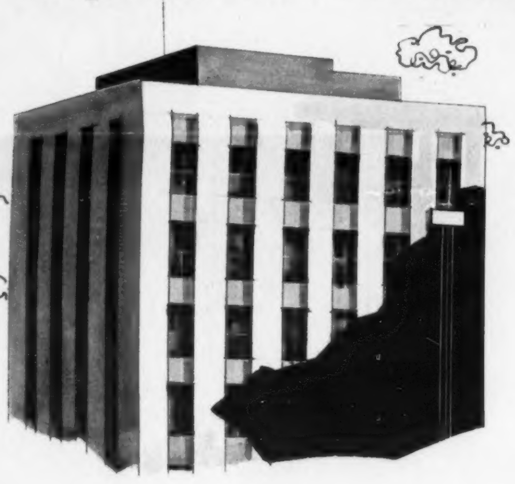
In addition, YORK's perfected method of fluid distribution throughout the system requires less pump horsepower per ton of cooling.

Notice how the lithium bromide solution trickles over the outside surface of the steam-filled generator tube bundle. System responds faster at start-up and can be more closely controlled to meet sudden load changes. There's less noise, too.

Wherever low-pressure steam or high-temperature water is available — in office buildings, hotels, hospitals and industrial plants — there's a place for a YORK Lithium-Bromide Absorption System. Available in capacities ranging from 100 to 740 tons.

# LOOK INSIDE

## Revolutionary 3 Pipe Induction System With Instant Response That Eliminates Zoning of Air and Water



Here is an induction air conditioning system that is unusually simple to lay out, and yet possesses flexibility never before attained in systems of this kind.

Designed around YORK's new Hi-I induction unit, the 3-pipe system eliminates summer-winter changeover and nighttime shutdown, and offers dramatic savings in power and steam costs.

No zoning of ventilating air or supply water is required. Constant quantities are delivered uninterruptedly to all points. Room temperatures are completely and automatically controlled at individual room units.

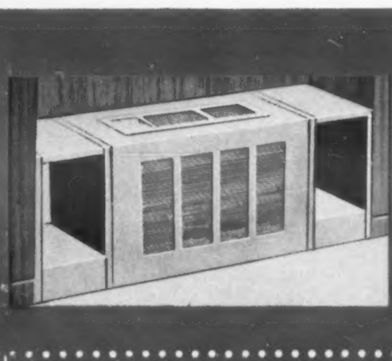
Automatic unit control valve provides room occupants with 50% greater personal comfort control the year 'round.

# LOOK INSIDE

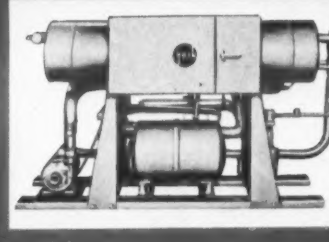
## The First Completely Packaged Hermetic Centrifugal Water Chilling System

You'll see a factory engineered-and-packaged centrifugal water chilling system, complete in every sense of the word. It's the YORK single-stage TURBOPAK, and it's hermetic. Lighter and 50% smaller than any other comparable system, too. The secret lies in the built-in world-famous Borg-Warner transmission gear. There's a fully wired, electronic control center for precise, automatic capacity control. One piece, rigid base construction simplifies layout, eliminates field assembly.

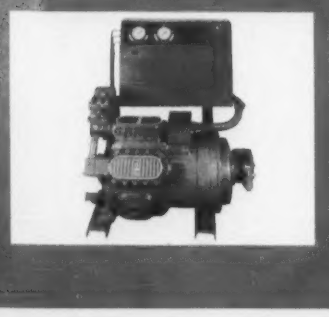
## Plus!



**Hi-I Induction Unit**, featuring YORK patented primary air nozzles for quiet operation, meets air conditioning requirements for high secondary-coil capacities. Attractive factory-fabricated enclosures for that "built-in" look are also available.

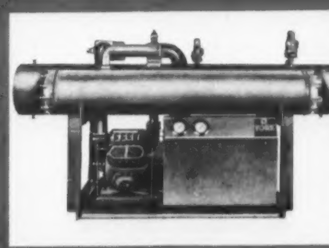


**HYDRALINE Packaged liquid chiller**, features YORK "sealed-in-steel" hermetic compressor, fully insulated water chiller, water cooled condenser, chilled fluid pump, piping and wiring, and refrigerant and oil charge. Nominal capacities 7½ to 15 tons.



**Hermetic Compressor unit**, combines a proven YORK V/W compressor and a refrigerant-cooled motor, with an attractive, fully wired, totally enclosed control center. No belts, couplings or shaft seals. Requires less than seven square feet. In 10- to 45- ton nominal capacities.

**Fan-coil Air Conditioners** are available in 20 floor-, wall-, and ceiling- mounted models—the widest selection offered. Units have Underwriters' Laboratory Approval and feature permanent, low-current drawing, split-capacitor fan motors.

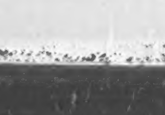


**YORK V/W packaged water chiller**, the smallest of its kind, comes complete with interconnecting piping, automatic controls, wiring and insulation. Flooded-type cooler and positive refrigerant-feed control assures maximum efficiencies. Available in capacities from 18 to 250 tons.

# LOOK INSIDE York Packaged Products For Answers to Your Special Problems:

**York Champion Air Conditioners** for commercial use are air cooled...use *no water*...deliver 10 to 15 tons of natural cooling. Have step-start, step-capacity control.

**York Room Air Heat Pumps** cool in summer, heat in winter. Three compact, stylish window units: (1) Citation, 230 V. (2) Medalist, 115 V, 7½ Amp., (3) Metropolitan, 230 V.



**York Residential Heat Pumps** cool in the summer, heat in the winter—using only outside air and electricity. Have twin cooling systems, twin auxiliary heaters.

**York Furnaces** have exclusive Silver "V" Burners that provide more heat, more economically. Fully A.G.A. approved for use with natural mixed, propane or manufactured gas.

## Certified Maintenance

For system performance without maintenance worries, a YORK Certified Maintenance Contract is what you're looking for. Gives you complete maintenance, regular inspections, emergency service when required, all parts and repairs, spring and fall changeover, and start-up and shut-down. All for a nominal, agreed-on-in-advance fee.

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# Hotpoint Forecasts Industry Sales of 21,750,000 Room Air Conditioners by '68

(000 omitted on unit figures)

| Year | Wired Homes (Millions) | % Sat. | Homes With One or More Units | Residential Units In Use | Residential Net Additions† |  | Non-Residential Net Additions† |  | Replacements† |  | Total Domestic Shipments | Total Industry Shipments* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  | Units | % | Units | % | Units | % |  |  |
| 1958 | 49.6 | 10.4 | 5,158 | 6,374 | 1,109 | 73.4 | 368 | 24.4 | 33 | 2.2 | 1,510 | 1,600 |
| 1959 | 50.8 | 11.7 | 5,944 | 7,389 | 1,015 | 72.5 | 330 | 23.6 | 55 | 3.9 | 1,400 | 1,500 |
| 1960 | 52.0 | 13.0 | 6,760 | 8,559 | 1,170 | 71.3 | 372 | 22.7 | 98 | 6.0 | 1,640 | 1,750 |
| 1961 | 52.9 | 14.1 | 7,459 | 9,749 | 1,190 | 68.8 | 386 | 22.3 | 154 | 8.9 | 1,730 | 1,850 |
| 1962 | 53.7 | 15.0 | 8,055 | 10,954 | 1,205 | 66.2 | 389 | 21.4 | 226 | 12.4 | 1,820 | 1,950 |
| 1963 | 54.6 | 16.3 | 8,900 | 12,179 | 1,225 | 64.2 | 377 | 19.7 | 308 | 16.1 | 1,910 | 2,050 |
| 1964 | 55.4 | 17.4 | 9,640 | 13,424 | 1,245 | 62.3 | 351 | 17.5 | 404 | 20.2 | 2,000 | 2,150 |
| 1965 | 56.3 | 18.5 | 10,416 | 14,689 | 1,265 | 59.1 | 340 | 15.9 | 535 | 25.0 | 2,140 | 2,300 |
| 1966 | 57.1 | 19.5 | 11,135 | 15,969 | 1,280 | 54.9 | 363 | 15.6 | 687 | 29.5 | 2,330 | 2,500 |
| 1967 | 58.0 | 20.4 | 11,832 | 17,269 | 1,300 | 51.6 | 363 | 14.4 | 857 | 34.0 | 2,520 | 2,700 |
| 1968 | 59.0 | 21.2 | 12,508 | 18,598 | 1,329 | 47.3 | 379 | 13.5 | 1,102 | 39.2 | 2,710 | 3,000 |

*Includes exports. †See explanation in story.

* * *

CHICAGO—By 1968, the industry will sell 21,750,000 room air conditioners, the central market research department of Hotpoint Co. predicts.

By that time there will be 18,598,000 room units in 12,508,000 homes, the company forecasts.

Sales of room air conditioners in the United States for 1959 are forecast for the industry at 1,400,000 units for the fourth highest year in air conditioner history.

Of this 1,400,000 units 3.9% are replacements, 23.6 are non-residential net additions, and 72.5% are residential net additions.

Hotpoint explained that net growth is the amount of increase in the number of air conditioners between one year and the next. Thus "replacement" figures include not only the number sold to replace present air conditioners but also the number sold to new owners to offset air conditioners that were scrapped and not replaced.

In 1959 about 7,389,000 units will be in use and homes with one or more units will increase to 5,944,000. In 1959 the market will reach an 11.7% saturation point.

In 1963 industry (U.S.) shipments will rise to 1,910,000 of which 16.1% will be replacement units, 19.7% will be non-residential net additions, and 64.2% will be residential net additions. By 1963 there will be 12,179,000 residential units in use and homes with one or more units will total 8,900,000.

By 1968 industry (U.S.) shipments of room air conditioners will rise to 2,710,000. Of this amount 39.2% will be replacements, 13.5% will be non-residential net additions, and 47.3% will be residential net additions.

# *Airtemp Aims To Use Distributors As Single Line of Distribution*

DAYTON — Stabilization of distribution through independently owned and operated wholesale distributors, and improvement of profits for such distributors, were listed here recently as top objectives of the management team of Airtemp Div., Chrysler Corp., according to J. B. Ogden, vice president in charge of sales.

"Our goal is to make the Airtemp line more profitable for distributors across the country," Ogden explained, "and to use them as our single line of distribution."

He said the firm already had embarked on a program aimed at accomplishment of these goals.

"We are placing a renewed emphasis on brand name loyalty," he said, "which we are confident will influence potential buyers of heating and air conditioning equipment, and thereby increase sales and profits for our distributors and dealers."

Ogden said Airtemp also was expanding its entire distributor-dealer organization.

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# FHA Revises Heating Requirements In Proposed Minimum Property Standards

DETROIT — A number of changes have been made in the heating requirements contained in the new Minimum Property Standards for One and Two-Family Living Units recently published by the Federal Housing Administration.

Generally, the changes have made requirements more specific and eliminated some of the vagueness builders and contractors have faced in the past, an FHA official said.

The new MPS is not yet in effect. Commissioner Norman Mason has indicated that FHA will give the industry until April at least to get acquainted with the new regulations.

Heating requirements in the currently used MPS Revision No. 51 have been largely rewritten in the new MPS. Most of the rewriting shortens and clarifies the rules rather than changing them.

References to certain types of equipment, such as vaporizing type oil burners, radiant glass heaters, and convection-resistance units, have been omitted. In these cases, a local FHA inspector indicated, present requirements will continue in force.

Heating requirements are found in section 1003. Here are some of the new or significantly altered provisions.

First new requirement is that "heating systems shall be designed, installed, and balanced or adjusted to provide distribution of heat to all habitable rooms and other spaces in proportion to the calculated heat loss of the spaces to be heated. The temperature difference between any two habitable rooms shall not exceed 5° F. with temperatures taken in the center of the room 30 in. above the floor."

In making heat loss calculations, the MPS specifies that inside design temperature shall be not less than 70° F.

For other than electric heating, calculated heat loss of the living unit shall not exceed 50 B.t.u.h. per sq. ft. (now 60 B.t.u.h. per sq. ft.) of total floor area measured to the outside of exterior walls.

Heat loss through all vertical exterior walls, windows, doors, etc., shall not exceed 30 B.t.u.h. per sq. ft. of total floor area. Heat loss through floors over unheated basements and crawl spaces shall not exceed 15 B.t.u.h. per sq. ft. of floor area. These are new requirements.

Another new requirement is that living units heated with electrical energy (direct or indirect resistance, or heat pumps) shall be insulated in accordance with recommendations in the "Manual for Electric House Heating" by National Electrical Manufacturers Association.

The new MPS contain a formula for calculating heat loss through concrete slab floors that did not appear in MPS Revision No. 51. However, FHA had one in its engineering bulletins that field inspectors used. The newly-published formula requires 25% more insulation than the old one, local officials said.

## Affect: . . .

The SBI Rating Code published by the Steel Boiler Institue is no longer included among the accepted sources of boiler ratings.

Among other accessories, each steam boiler must be equipped with a steam gauge and a water gauge glass with gauge cocks and drain. The "and drain" is new.

### Shutoff Valve, Drain Cock for Boilers

Also new is the requirement that boilers shall be connected to the cold water supply with a shutoff valve and shall be provided with a drain cock with hose connection. Pressure reducing valves, where used, shall be installed between the shutoff valve and the boiler.

The section on radiator, convector, and baseboard systems says that these and "other terminal heating devices" (new) located in bedrooms shall be provided with an accessible shutoff valve or damper or otherwise arranged to provide a reduction in heat output.

It also says that single circuit or series-loop baseboard type systems in each living unit, where each terminal heat-emission unit is sized to within 10% (now 50%) of the calculated heat loss of the room or space served, may be installed without balancing devices.

In panel hot water systems, all piping shall be of the same materials and any exposed connections between piping of dissimilar metals shall be made with an insulating fitting (rather than an insulated joint, as now).

For warm air systems, the new MPS covers "unlisted furnaces" for the first time. It says:

"Unlisted furnaces shall be installed with a minimum clearance of 6 in. between the top, bonnet, plenum, or the top of any extended plenum or duct within 3 ft. of such furnace, and combustible material.

"This clearance may be reduced when one of the specified forms of protection listed in NFPA Standard No. 90-B, or Appendix I of National Building Code is installed."

It also requires that the heating contractor "provide a shutoff damper or adjustable combination shutoff and balancing damper" (new) in each supply outlet located in a kitchen "or bedroom" (new).

To omit insulation from ducts in crawl spaces, the MPS requires only that the crawl space have closable louvers.

### Protection from Overheating

Requirement for protection of hand fired warm air systems from overheating has been changed considerably. Present regulation says it can be done by omitting filters in furnace and omitting register valves in registers serving the living room and bathrooms.

But the new MPS says it shall be done by "omitting register valve in register serving

Electrowheel*
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Here's another Lau first, designed to help solve those cramped space blower installation problems. The versatile Lau "Electrowheel" is recommended for use whenever air moving efficiency is a requirement but space limitations present a problem. The "Electrowheel" is extremely efficient when operating where the utmost in compactness and smooth, quiet operation is required.

Lau "Electrowheel" features include stationary rubber mounted shaft, sealed ball bearings, rigid one piece motor mounts, 30" motor leads with BX connector and the same high standard of quality found in every Lau engineered product. One moving part assures years of trouble-free service.

When an installation requires a high performance blower the Lau "Electrowheel" is the logical answer. Write for Lau Catalog LSO-463 for complete information.

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See the "Electrowheel" and other Lau Blower engineering firsts at the 14th Annual Heating & Ventilating Exposition, booths 232-233.

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## Calculations, Clearances, Controls

the living room or in ducts serving other rooms having an equivalent area."

For perimeter warm air heating, the new MPS does not require non-combustible material to be used in the construction of risers to supply outlets and the horizontal connection to risers for a distance of two-duct diameters from the riser as present rules do.

It also is silent on vapor barrier membrane installed under concrete slab on ground and ducts in or under the slab. It also doesn't mention encasement of such ducts.

Another slight change is that the bottom of all ducts adjacent to the perimeter of the slab shall be not lower than 2 in. above the finish grade.

In crawl spaces used for supply or return plenum, ground cover material shall have joints lapped at least 2 in. (now 3 in.) and not sealed. The requirement adds that ground cover of a combustible material shall be covered with at least 2 in. of sand or gravel.

MPS says that the surface of the ground shall be not less than 18 in. and not more than 24 in. below the bottom of the floor joists. (Presently floor joists and beams).

### Two Ventilators For Crawl Space

New is a requirement that all crawl spaces have at least two foundation wall ventilators having an aggregate net free ventilating area not less than 1/1500 of the area of the crawl space.

Another new one is that a non-combustible receptacle shall be provided under each floor-type supply register or return grille, in accordance with NFPA Standard 90-B.

MPS requires that at least four stub ducts (no specific number is now required), connected to plenum, shall be provided in the crawl space. Ducts shall be directed toward supply registers and terminate not less than 6 ft. (now 5 ft.) from the plenum.

Turning to self-contained heating units, such as room or space heaters, floor furnaces, and vented recess heaters, MPS says these may be installed only in single story structures unless adequate provision is made to prevent circulation of heated air between stories. This is not required in present regulations.

Fans installed in self-contained heating units shall have a capacity of not less than 9 c.f.m. (now 6 c.f.m.) per 1,000 B.t.u.h. output.

While the MPS continues to require that the distance between heater outlet and the center of any space to be heated by it not exceed 18 ft., or 20 ft. for a kitchen, it has dropped the provision that this distance might be increased by 5 ft. in areas having an outside design temperature of 20° F. or higher.

A new provision says thermostats used to control self-contained heating units shall not be located in a space or room which can be separated from the space or room in which the register of the heater is located.

Minimum width of unobstructed passageway to be provided on at least one side of a flat register floor furnace or pipeless furnace has been increased from 18 in. to 2 ft.

For electric heating, the formula for adjusting the difference between labeled voltage and service voltage has been altered. Under the present regulation adjusted B.t.u. rating equals 3,413 times the square of the service voltage divided by the square of the label voltage.

In the MPS formula, adjusted B.t.u. rating equals 3.41 times the square of the service voltage times the label input in watts.

Formula for estimating annual consumption in kwh. has also been altered. The present formula: F = H × D over Td × 170 will read F = H × D over Td × 185.

Present regulations have been stiffened to say that installation recommendations contained in the ASHAE Guide and those of the manufacturer "shall," rather than "should," be followed.

Maximum surface temperature for electric panels has been raised from 120 to 150° F.

MPS says bathrom wall insert heaters and switches shall be located as far as practicable from plumbing fixtures, but at least 30 in. from tub or shower.

Construction and installation of containers and service piping for Liquified Petroleum gases shall comply with NFPA Standard No. 58 under the new MPS. Present regulations specify NFPA Pamphlet No. 52.

## Pocket Slide Rule Quickly Estimates Heat Loss, Cost for Electric Heat

MEMPHIS—A new slide rule specifically developed to provide fast and accurate estimation of heat loss and heat cost of electric heat operation has been devised by a manufacturer of electric heating systems.

Called an Estimator, one side of the slide rule determines heat loss, the other heat cost, according to Hunter Div., Robbins & Myers, Inc. The device is small enough to fit into a coat pocket.

The Estimator consists of two parts, one the slide rule proper and the other an 8½ x 9¼-in. chart printed on heavy paper stock. The latter folds around the Estimator when not in use.

The paper chart lists the outside design temperatures and winter degree days for 152 U. S. cities. It also points out the factors necessary in establishing a basis for evaluating the "degree of weatherproofing" in a residence or other structure.

According to the company, results obtained are in accordance with operating cost formulæ developed by the Electric Heating Section of the National Electrical Manufacturers Association (NEMA).

Hunter Div. of Robbins & Myers, 2500 Frisco Ave., Memphis 14, Tenn., is making its Estimators available to readers of AIR CONDITIONING & REFRIGERATION NEWS. Requests should be directed to the attention of James B. Gantt at the Memphis address.

On Stream!
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Just completed . . . a spanking-new plant at Institute, West Virginia, built by Union Carbide Chemicals Company to supply 50 million pounds of fluorocarbons a year! That means new UCON Refrigerants are available now . . . bringing you *all* the advantages of the nation's newest refrigerants. You'll get . . .

**UNSURPASSED QUALITY**, meeting the strictest refrigeration and air conditioning industry standards for dryness and purity.

**NEW PERSONALIZED SERVICE** from technically-trained representatives—the UCON Refrigerants service force is the largest in the country.

**ON-TIME DELIVERY** from the largest network of distribution points serving the refrigeration and air conditioning industries.

**FULL CHOICE OF UNIT SIZES.** Meet *your* quantity needs with UCON Refrigerants supplied in standard-sized units.

**TO GET FULL DATA ON** UCON Refrigerants now, see your wholesaler, or write: UCON Refrigerants, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y. Call, write or wire us, any time! Attention, Dept. E-1

"Ucon" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

**These 5 UCON Brand Refrigerants will meet your refrigeration and air conditioning needs**

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UCON Refrigerant 12 Dichlorodifluoromethane
UCON Refrigerant 22 Monochlorodifluoromethane
UCON Refrigerant 113 Trichlorotrifluoroethane
UCON Refrigerant 114 Dichlorotetrafluoroethane

**UNION CARBIDE CHEMICALS COMPANY** *Division of Union Carbide Corporation*

# Training New Serviceman

## *Teach Him To Be a 'Good Listener'; Give Him His Instruction In the Shop, Not on the Job with Another Man*

COLUMBUS, Ohio—"Service personnel must be good listeners.

"Then they can tell whether screws are loose in the equipment or in the customer's head—and proceed accordingly."

Teaching the new serviceman to be a good listener is one of the responsibilities of an adequate training program, according to Charles G. Bell, president, Bell & Hughes, Fresno, Calif., who addressed the 21st annual meeting of the Refrigeration Service Engineers Society recently.

Whether you are breaking-in a young boy or a middle aged and mature married man, do the breaking-in at the shop. Here you can observe the man's work, aptitudes, and interests, suggested Bell, and can more readily ascertain his suitability for field service work.

It is too costly to train a man by sending him out on the job with an experienced serviceman—too costly both not only for the service company but also the customer.

Claiming that the manufacturers of the various components and assembled items have the resources and responsibility for ultimate training on their equipment, Bell suggested that manufacturers might consider sending well-trained factory instructors traveling through the country giving talks to individual service companies and local groups and accompanying servicemen on actual calls.

Outlining such subjects as correct installation and servicing techniques which should be included in a training program, he warned that the individual serviceman has more difficulty getting information and training from manufacturers than a group or larger service company.

At this point, a member of the audience vigorously agreed and complained of specific manufacturers' unwillingness to help the smaller serviceman. The gentleman was dissuaded from naming the actual companies publicly.

As an example of his troubles, he cited 20 1-ton room units which had been installed on a military base by a distributor some 70 miles away. Called in to service a couple of these units, he encountered for the first time in his experience motor compressors without relays or capacitors.

Having determined that the difficulty was with the motor compressor, he sent away for a replacement and received a motor compressor with a relay and capacitor, but no wiring diagram.

When he wrote to the company explaining his predicament, he received an answer which said in effect, "If you are servicing this product, you should be familiar with the wiring," he claimed.

While agreeing that relationships between servicemen, distributors, and manufacturers can stand improvement, Bell emphasized that whether a man becomes a good serviceman or not depends in greatest part upon his own desire and ability to work and study and make use of the information which is available to him.

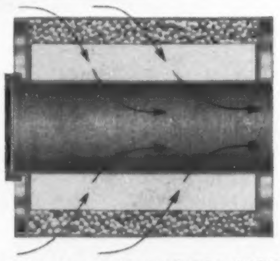
NOW...Split-Second Handling
With the New Type 75
HENRY MULTIPLE
CARTRIDGE DRIERS
PATENT PENDING
FLOW
An efficient and high capacity multiple cartridge® filter-drier with a drying and flow capacity range up to 125 tons.

Low Pressure Drop...No By-Pass Required

875-CMS DRI-COR® Filter-Drier Cartridges for these new driers are self-sealing and self-positioning. It requires only a few seconds to insert the cartridges into the drier shell, resulting in a minimum of exposure to the atmosphere and loss of cartridge drying capacity. Thus, the cartridges are clean, dry and complete—due to efficient design and split second handling.

The refrigerant flows uniformly over the total cartridge surface, through the desiccant bed and each filter core. This results in maximum moisture and acid removal with high flow capacity and low pressure drop.

These brass driers contain from two to five cartridges and are available with connection sizes ranging from 1⅛" to 2⅛" O.D. Solder.


CAT. No. 875-CMS DRI-COR® FILTER-DRIER CARTRIDGE WITH

1. OUTER PERFORATED BRASS SHELL.
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## Oil Accumulation In Ammonia Evaporator Is Serious Problem

MIAMI BEACH, Fla.—Accumulation of oil in ammonia evaporators is a serious problem, especially on systems operating at low temperatures, Dan Wile, vice president and chief engineer of Recold Corp., noted at the 49th annual convention of the National Association of Practical Refrigerating Engineers.

"No ordinary oil separator installed in the compressor discharge line can remove all the oil," he told the engineers.

"It is essential to first desuperheat the hot gas and then put it through an efficient separator.

"We have found that it is necessary to apply heat to the bottom of the oil separator to avoid accumulation of ammonia during certain operating conditions, such as cold weather."

He accomplished this by running the discharge line along the base of the trap.

He advised the engineers to put the desuperheat coil on the evaporative condenser and install the oil separator between this coil and the main tube bundle of the condenser.

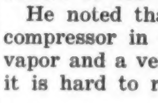
He noted that oil leaves the compressor in the form of hot vapor and a very fine fog. Thus it is hard to remove.

## *Lithium Bromide Being Shipped In Lined Drums*

PHILADELPHIA — Lithium bromide, a hard-to-package chemical used in air conditioning systems, is being shipped by Foote Mineral Co. in drums with pigmented phenolic type linings.

Lithium bromide makes it possible to use water efficiently as a refrigerant in air conditioning systems. In two important respects, it acts like common calcium chloride. It is highly hydroscopic and corrosive.

This corrosive characteristic makes it difficult to ship in ordinary steel containers. However, Foote Mineral of Philadelphia found it could successfully ship the chemicals from its Exton, Pa. plant in lined drums supplied by Jones & Laughlin Steel Corp.'s Container Div., the division reported.


IMPROVED HYDŌ HOLLOW CONE SPRAY NOZZLES CAN'T CORRODE
Spraying Starts Below ½ PSI
Injection Molded of "Tenite" (Butyrate)

| NOZZLE NO. | IPS | GPM AT & PSI | SPRAY ANGLE |
|---|---|---|---|
| H .8 | ⅜" | .8 | 60° |
| H 1.0 | ⅜" | 1.15 | 75° |
| H 1.8 | ½" | 1.8 | 90° |
| H 2.5 | ½" | 2.5 | 100° |
| H 3 | ¾" | 3.3 | 76° |
| H 5 | ¾" | 5.0 | 85° |
| H 7 | ¾" | 7.0 | 100° |

AUSTIN MANUFACTURING CORPORATION
305 Perry Brooks Bldg. Austin 1, Texas

# Electric Utility In Southern California Backs Air Conditioning with Ad Campaign

LOS ANGELES — How some electric utilities have swung into hard-hitting promotion for the air conditioning industry has been demonstrated in the concerted advertising and promotional campaign on air conditioning and heat pumps conducted by Southern California Edison Co. starting last summer.

The stepped-up program emphasized newspaper and magazine advertising, billboards, and special promotional and educational booklets.

The southern California utility split the campaign three ways. Its approach has been directed at air conditioners, central-system heat pumps, and room-type heat pumps.

Newspaper advertisements were placed in a number of dailies throughout the company's 10-county service territory, and advertisements in Sunday magazine sections of Los Angeles newspapers, as well as in *Sunset* magazine.

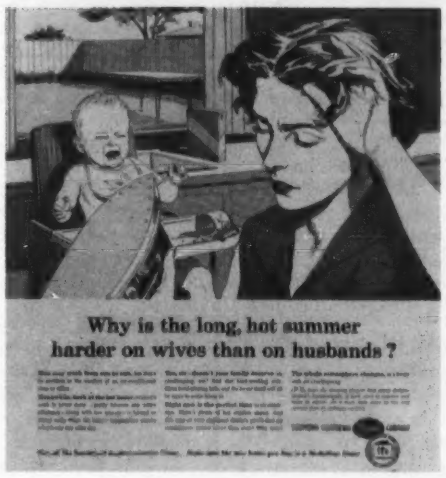
During August, alone, a total of 225 outdoor billboards carried strong messages on air conditioning.

One type of advertisement hit hard at the plight of the housewife who suffered through hot days, while her husband worked comfortably in an air conditioned office (with some innuendo about the strife likely to occur after he got home).

Another type of advertisement offered testimonials from users (who were pictured in the advertisement) on the merits of heat pump air conditioning.

An attractive booklet on heat pumps was produced and made available on request. A coupon telling how to get the booklet was included in special heat pump ads, and it was also offered on television. By the end of October, the utility had received several thousand requests for copies of the booklet.

Called "Now . . . You Can Work Wonders with Weather" it emphasized the dual functions of heat pumps for both cooling and heating — all in a single unit. It explains how heat pumps operate, gives costs data, and lists manufacturers.


Why is the long, hot summer harder on wives than on husbands?

PLIGHT of the housewife during the long hot summer without air conditioning was the theme of this advertisement, which was a part of the Southern California Edison Co. campaign to promote air conditioning.

## Mueller Climatrol Re-aligns Sales, Marketing Set Up

MILWAUKEE — Mueller Climatrol Div. of Worthington Corp. has completed a re-alignment of its sales and marketing organization so as to better service all of the company's customers.

Donald H. Davidson, marketing manager, pointed out that to prepare for ever-increasing growth it is necessary to offer more than top quality products and good sales and promotional programs. It is also essential to offer consultation in all phases of business management, he said.

To implement this philosophy, Richard B. Schmidt, Mueller Climatrol sales manager, has appointed four assistant sales managers and has instituted a program to support them. The assistant sales managers are: Jack H. Beck, W. A. McLemore, M. H. Thomas, and Leo M. Winter. All will reside in Milwaukee.

Beck, who has been with the company since 1949, was appointed regional manager for northeastern United States in 1957. McLemore started at Mueller Climatrol in 1953 as a sales representative and was appointed regional manager of western states in 1957.

Thomas started with the company in 1949, was made regional manager, midwestern states, in 1956. Winter, who has been with Mueller Climatrol since 1952, has been a sales representative since 1954.

**For Your Reprint Copy**

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.

ACTUAL SIZE

Here's how General Electric has reduced capacitor size and weight since 1956

| Typical Ratings | Reduction Volume | Reduction Weight |
|---|---|---|
| 20 mfd—370 V | 24% | 25% |
| 25 mfd—370 V | 34% | 29% |
| 20 mfd—440 V | 28% | 24% |

25 mfd—370 V rating pictured

FROM GENERAL ELECTRIC

NEW

Flat-oval Capacitors

PROVIDE HIGHER μf RATINGS IN LIGHTER, SMALLER CASES

Now General Electric offers a new line of motor-run capacitors designed especially to save space in today's more compact air conditioning equipment.

The new capacitors feature the "flat-oval" case—a unique design that allows maximum volt-microfarad ratings in smaller, lighter capacitors. By making optimum use of available space while maintaining sufficient case surface to provide adequate cooling, flat-oval capacitors operate with uniformly high characteristics. The table above shows how design innovations, such as the flat-oval case, have enabled General Electric to reduce the volume and weight of air conditioning capacitors.

New, flat-oval capacitors also feature an improved phenolic cup design. While maintaining increased creepage distance, the new cup eliminates the collection of troublesome moisture. The new cup shape also makes possible painting the cover, as well as the case, with General Electric's corrosion-resistant Granite-Gray paint.

For complete details on General Electric's new air conditioning capacitors, contact your nearest Apparatus Sales Office; or write to General Electric Co., Section 448-5, Schenectady, N. Y.

*Progress Is Our Most Important Product*

GENERAL ELECTRIC

# *Inside Dope*

By GEORGE
F. TAUBENECK

*(Continued from Page 1, Col. 1)*

(1) She should be home when she says she will, and not leave a note on the door telling where the key is.

(2) "We can't go in alone. *She should be modestly dressed, too. You'd be surprised at some of the things we see."*

(3) Pets and children should be kept in another room.

(4) The woman should be on hand to explain—and in a few words—what is wrong, and to "listen to our explanations, also," he added.

Manufacturers are paying more attention to service problems today, obviously. Witness the Frigidaire and Hussmann advertising campaigns in the NEWS. More such are coming.

Whether inspired by high inventories or by constant cries from women customers, many companies are looking for sound methods to checkmate the complaints.

General Electric executives, for example, declare that they are tightening reins on testing materials, and are providing more parts for independent servicemen.

Furthermore, they are issuing Trouble Guides for users.

"Tens of thousands of service calls a year could have been solved simply by plugging in an electric cord, cleaning an air conditioner, or using hotter water in a washing machine," observes W. H. C. Beckett, a G-E product service specialist.

Those "Trouble Guides" suggest things a householder can try before calling for service.

General Electric—like Frigidaire and Hussmann— is aiming to give repairmen greater pride in their work, according to C. K. Rieger. "The job of outguessing the woman is a continuing challenge," he says.

## *Mrs. John Bull Faces Life—and Refrigeration*

As faithful readers of this column know (or should, if they've minded their homework) the British people have been reluctant to introduce refrigeration into their homes.

They've even avoided iceboxes down through the years. Only recently have they started to purchase electric refrigerators in appreciable quantities.

To call attention to the situation, a Scottish newspaper, *The Edinburgh Evening Dispatch* staged a contest with a Prestcold refrigerator as a prize. Readers of the *Dispatch* were invited to relate an occasion when they badly needed a home refrigerator.

A large number of replies was received. One after another revealed makeshift methods which English folk were adopting to keep food cool and in good condition.

Stone floors, drafty corridors, wind-swept window-sills, and even staircases were in regular use—with frequently unsatisfactory and sometimes calamitous consequences.

One lady, for example, placed red jelly on an upstairs stone staircase. Later that night her husband came upstairs to bed, and put his bare foot in the jelly.

In the words of the teller of the tale, he was "hopping mad," which is understandable. His wife, having forgotten about her jelly, assumed his foot was covered with blood and nearly fainted!

So much for the staircases. What of the window-sills?

One housewife was expecting the return home of her sailor husband. She bought two large lamb chops with which to welcome him. During the night she heard high-pitched cries and eerie wails.

Happy but excited sea-gulls had swooped on, wrangled over, and finally ate up every morsel of the windowsilled meat.

Those mighty atoms, marauding mice, were a menace in many households, too. One lady who owned a small shop was brought some food as a present by a friend. Expressing thanks, she immediately put it into a strong steel safe.

Her friend was overwhelmed by this careful reception of what was really quite a small offering and said, "but it only cost me six shillings." An explanation about mice followed, and a different picture of foodstuff values resulted.

Pancakes and piglets were subjects of another story. The day before her marriage a bride-to-be was visited by her minister, who was surprised and perturbed to find her loudly scolding a piglet.

It turned out that she had put batter for pancakes on the cold stone floor of the pantry and, in her pre-wedding excitement, had left the door open.

In came the pet piglet. Within seconds it changed itself from a black-and-white animal to a batter-colored animal—pancake mix all over its face.

The clergy also were involved in another anecdote. Intending to entertain several of them, an English hostess endeavored to keep a brecket of fish fresh with a liberal dose of vinegar.

Only when ecclesiastical expressions became uncontrollable, and divine aid was being sought to enable their owners to cope with the situation, did it turn out that by accident the pre-

*(Concluded on next page)*

Only Halstead & Mitchell offers a cooling tower with a 20-YEAR GUARANTEE

ON THE WETTED DECK
AGAINST FAILURE
DUE TO ROTTING
OR FUNGUS ATTACK

Here's why this is important: Fungus growth on cooling tower wood fill very often can accumulate to the extent that it actually obstructs air flow through the tower. This reduces tower capacity and affects performance of the refrigeration or air conditioning equipment involved. In severe cases, the wood will rot and cause tower failure.

***Treated Deckings***—For positive protection against such harmful effects, Halstead & Mitchell subjects the wood deck material used in all H&M cooling towers to a special, pressure creosote treatment. That's why *only* Halstead & Mitchell offers a 20-Year Guarantee on the wetted deck against failure due to rotting or attack by fungus. Original tower capacity is maintained, and that reliability is what cooling tower purchasers need.

***Anti-Corrosion, Plastic Coatings***—Halstead & Mitchell Cooling Towers have many other design features that increase tower life and keep maintenance costs to a minimum. For instance, the cooling tower casings are completely protected against corrosion by separate plastic coatings of Vinsynite, Vinyl Zinc Chromate, and chlorinated rubber, *after assembly*. Every edge, every corner, is sealed against rust.

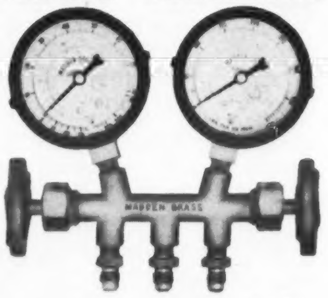
***Permanently Sealed Bearings***—Another example, fan bearings are permanently lubricated and sealed. Damaging moisture is kept out. Maintenance and periodic greasing are eliminated.

H&M Cooling Towers are available in capacities of 2 thru 125 tons. Types include propeller fan, centrifugal fan and take-apart models. See your local wholesaler, or write for more information. Halstead & Mitchell, Bessemer Building, Pittsburgh 22, Pa.

HM
Halstead & Mitchell

COOLING TOWERS • WATER-COOLED CONDENSERS
AIR-COOLED CONDENSERS • FINNED COILS

NEW
...FOR EASIER
FASTER SERVICING



Pat. Pending

Designed for convenient charging, purging, testing etc., this new compact unit features an all brass forged body, easy-grip hand wheels, Teflon packing and seat for positive shut-off. Equipped with dual scale 2½-inch pressure and compound gauges. Hose connections ¼-inch male flare, gauge connections ⅛-inch female pipe thread.

HANDY HOSE HOLDER

Attaches to back of testing unit so free end of hoses can be conveniently coupled when not in use. Keeps them dry and free from dirt.

SEE YOUR MADDEN WHOLESALER

M
MADDEN BRASS
MADDEN BRASS PRODUCTS COMPANY
AURORA 6, ILLINOIS, U.S.A.
EXPORT: Ad Auriema 85 Broad St., New York, N. Y.

# *Inside Dope*

By GEORGE F. TAUBENECK

*(Concluded from preceding page)*

servative she had used was *turpentine!*

Flies often were a problem to English women, it developed. In one household everyone was instructed to keep the pantry door shut to keep flies out.

Having left a chicken in the pantry before going out, a mother was much disturbed to see, on returning, a note pinned to the pantry door. Printed on it in large, awkward childish letters were the words:

"Mum, there is a fly in the Pantry. I have shut it in."

The winning story came from a man. He told a good tale about his uncle and his grandfather who were rival fishermen.

Grandfather caught a large trout. He let it lay in state for two days, so that Uncle could come and see it, marvelling and envying.

Unfortunately, Uncle was delayed for another six days. Business in London. Grandfather, overruling all domestic objections, still kept the big fish to show his rival—in a kitchen which didn't have a refrigerator.

By that time its presence was unpleasantly obvious throughout the house. . . . Moreover, its effect upon the belated Uncle was lost because it had shrivelled until it was unimpressive.

All the Uncle said, when he finally arrived, was:

"Did you find it dead in the river?"

Disappointments, embarrassment, and waste of food and money are unfortunate enough. Much worse are ailments and diseases caused by food which has deteriorated.

"The answer is obvious—get a refrigerator!" sum up our friends from Britain's biggest refrigerator manufacturers — Prestcold — whose principals visited us recently in Detroit under the sponsorship of Ed Klee—and told these tales.

### *Final Thought*

In the *American Federationist* magazine, George Meany compares the American and Soviet economies.

One of the points frequently overlooked, he points out, is that although Soviet industry has made considerable progress, Communist rulers did not start from scratch, as their boasts imply.

Czarist Russia already was the sixth industrial country. Some of its plants, such as the Putilov works, were among the most modern prior to World War II.

Moreover, during War II, the U. S. and its democratic allies provided the Soviet Union with $15 billion in industrial machinery and products.

Finally, the Soviet has plundered Manchuria and the occupied countries of Europe, and utilized that loot for the expansion of Soviet economy.

## WHAT . . WHEN . . WHERE

### —A Guide to Coming Events of Interest

**International Heating & Air Conditioning Exposition and Annual Meeting**
**Jan. 26-29, Convention Hall, Philadelphia.**

**Home Improvement Products Show**
**Feb. 4-6, Coliseum, New York City.**

**National Association of Frozen Food Packers Convention**
**March 1-4, Conrad Hilton hotel, Chicago.**

**Gas Appliance Manufacturers Association**
**April 1-3, Americana hotel, Bal Harbour, Fla.**

**Edison Electric Institute**
**April 5-9, New Orleans.**

**Oil-Heat Institute of America**
**April 29-May 4, Seattle.**

**Air-Conditioning & Refrigeration Institute**
**May 3-6, The Homestead, Hot Springs, Va.**

**American Society of Heating & Air Conditioning Engineers**
**June 7-11, Vancouver, B. C.**

**American Society of Refrigerating Engineers**
**June 22-24, Lake Placid Club, Lake Placid, N. Y.**

*Win a Wagon?*

## Du Pont Contest To Start at Philadelphia

WILMINGTON, Del. — The man who best explains why he likes to do business with a "complete refrigeration wholesaler" will drive away in a new air conditioned station wagon come next summer, the Du Pont Co.'s "Freon" Products Div. promises.

More than 275 other prizes, ranging from $1,000 U. S. savings bonds to portable transistor radios, will be awarded to entrants in the company's "Partners in Profit" contest.

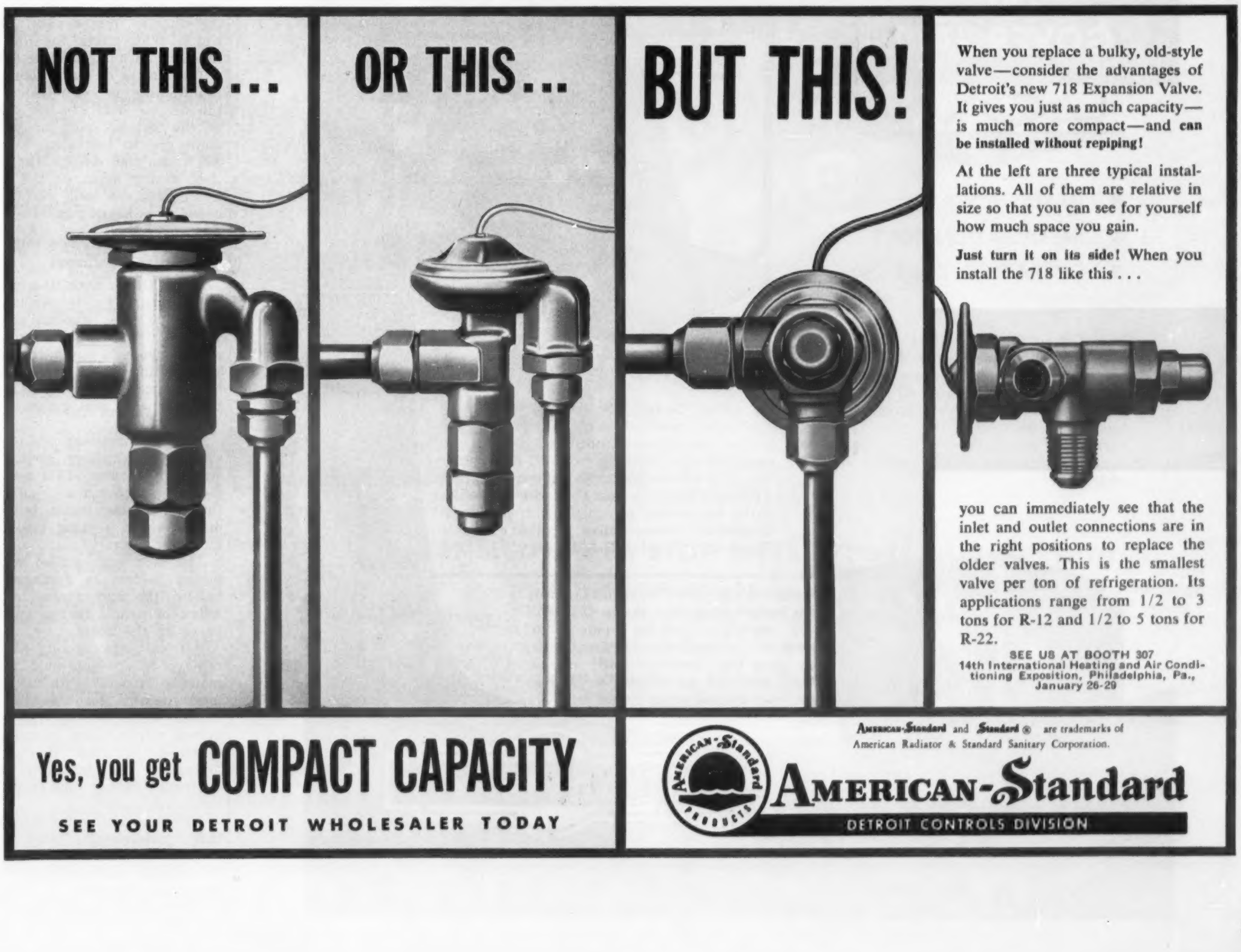
Running from Jan. 26 to May 15, the contest highlights a 1959 merchandising program designed to promote "Freon" refrigerants and the wholesalers who handle them.

Limited to customers of recognized wholesalers, the contest requires two things of an entrant. First, he must tell in 35 words or less why he feels "it's good business to buy from a complete air conditioning and refrigeration wholesaler."

Second, he simply selects and notes on his entry blank the quality of "Freon" refrigerant which he considers most important.

The Reuben H. Donnelley Co., Chicago direct mail and merchandising firm, will supervise the contest and determine winners on the basis of the entrants' originality, sincerity, and aptness of thought. Winners will be announced sometime early in July.

Du Pont's "Freon" Products Div. exhibit at the 14th International Heating & Air Conditioning Exposition, to be held Jan. 26-29 at Convention Hall in Philadelphia, will be devoted entirely to the "Partners in Profit" contest and will represent the official "kick-off" for the event. Many of the contest prizes will be on display in the exhibit.


NOT THIS... OR THIS... BUT THIS!

When you replace a bulky, old-style valve—consider the advantages of Detroit's new 718 Expansion Valve. It gives you just as much capacity—is much more compact—and **can be installed without repiping!**

At the left are three typical installations. All of them are relative in size so that you can see for yourself how much space you gain.

**Just turn it on its side!** When you install the 718 like this . . .

you can immediately see that the inlet and outlet connections are in the right positions to replace the older valves. This is the smallest valve per ton of refrigeration. Its applications range from 1/2 to 3 tons for R-12 and 1/2 to 5 tons for R-22.

SEE US AT BOOTH 307
14th International Heating and Air Conditioning Exposition, Philadelphia, Pa., January 26-29

Yes, you get COMPACT CAPACITY

SEE YOUR DETROIT WHOLESALER TODAY

American-Standard and Standard ® are trademarks of American Radiator & Standard Sanitary Corporation.

AMERICAN-Standard
DETROIT CONTROLS DIVISION

# LAS VEGAS—*Gambling AND Cooling Capital?*

## Construction Pickup, New Additions Could Boom Air Conditioning; Problems In Hotel Design, Use Call for Special Control Methods

LAS VEGAS, Nev.—In this gambling capital of the World, the casino operators are playing a new "numbers" game, and among the winners will be the air conditioning industry.

This "numbers game" is in terms of people. With the resort hotel and casino operators finding that "big spenders are becoming as scarce as Civil War survivors," the new emphasis is on "volume trade" which means that the operators are looking for the casual or "tourist" type of visitor—the guy who's in town for a couple of days and may drop $50 to $100—to keep their business going and growing.

What's the meaning of this to the air conditioning industry? As viewed by F. G. Brown of Brown Air Conditioning of Las Vegas, who has made many of the installations in the resort hotels on the "Strip" and in many commercial establishments and residences in the area, it means something like the following.

Hotel owners with casino and night clubs realize that there is great value in "having your own customers right under your own roof," and this will mean (1) that existing hotels will probably expand, and with the saying that "unless your hotel has 500 rooms by 1960, you won't be considered in the A-1 class," (2) any new hotel building will be of a sizable nature.

With the new Las Vegas $4½ million convention hall, with a seating capacity of 9,500; 22 meeting rooms; and 90,000 sq. ft. of exhibit space, scheduled to open this Spring, new construction may be expected to turn upward again (it has been dropping off from the peak reached in 1955) and get more in line with the continuing growth in visitors to the area, and gambling revenues.

For a specific example, Brown points to the Dunes hotel. He air conditioned the original structure, which opened three years ago, and he cites an announcement by M. A. Riddle, president of this resort hotel, of plans for a 305-room addition in the form of an added 20-story building (unusual for Las Vegas, where most hotels are of the rambling type, not more than two stories high). Furthermore, when the new addition is completed, the second floor will be devoted to a 1,200-seat convention hall and Grand Ballroom with exhibitor's space and a completely equipped stage.

### 'Most Air Conditioned City In the World'

With Las Vegas claiming the title of "the most air conditioned city in the world," (on a per capita basis by installed tonnage) Brown points out that any expansion will just have to mean more air conditioning.

Brown has done the air conditioning, using Worthington equipment primarily, for many of the major hotels along the "Strip," and his description of some of these installations brings to light the fact that the air conditioning contractor working in Las Vegas not only must have a thorough-going knowledge of the science, but he must be versatile and ingenious.

### 'Human Load' Shifts Fast In Las Vegas

First, there is the special problems in the fast-shifting "human load," brought about by the routine under which visitors to Las Vegas operate. In the afternoon they crowd the cocktail lounges and the casinos. Then they all crowd into the theater restaurants from 7 to 8 p.m. for the dinner show.

This is an amazing operation, from the standpoint of logistics, and at the same time it imposes some terrific burdens on the air conditioning system. In an hour and a half (from 7 to 8:30 p.m.) some 1,000 to 1,500 persons jam into the room, give their orders for drinks and food, are served, and finish with their dinners within that time. (Some of the more temperamental starring talent will not permit service of any kind once they start their act.)

The heat load thus imposed by the guests themselves is added to by hurrying waitresses, captains, and bus boys, plus the hot foods being served.

After the dinner show, the crowds push out into the casino and lounges again. The late show, at 11:30 to midnight, draws the crowds back into the theater restaurants, after which they again fill up the casinos and lounges until dawn.

The matter of guest room air conditioning is complicated by the sleeping habits of the guests in the hotels, most of whom don't get to bed until around dawn, so that despite the fact that during much of the year the nights are cool, very little guest room heating is called for.

### Dunes Hotel Installation Handles 20 Zones

In the Dunes hotel, the installation made by Brown takes care of 20 zones. Cooling is supplied by two Worthington 150-ton packaged liquid chillers. Each of these packaged chillers has a capacity of 1,800,000 B.t.u. and will cool 450 g.p.m. from 53° to 45° F.

Each compressor has three stages of unloading, giving six stages of cooling. This permits close proportional control throughout the entire building depending on varying load conditions.

The hot and chilled water piping system is arranged to balance the load created by the influx of people in the various parts of the hotel.

Refrigeration capacity control consists of a remote bulb, pneumatic thermostat, with the sensing element located in the chilled water supply. The required refrigeration capacity is obtained by the thermostat activating the pneumatic step controller having four steps for each compressor.

For increased water temperature, additional steps are brought in contact as required to maintain the specified chilled water temperature.

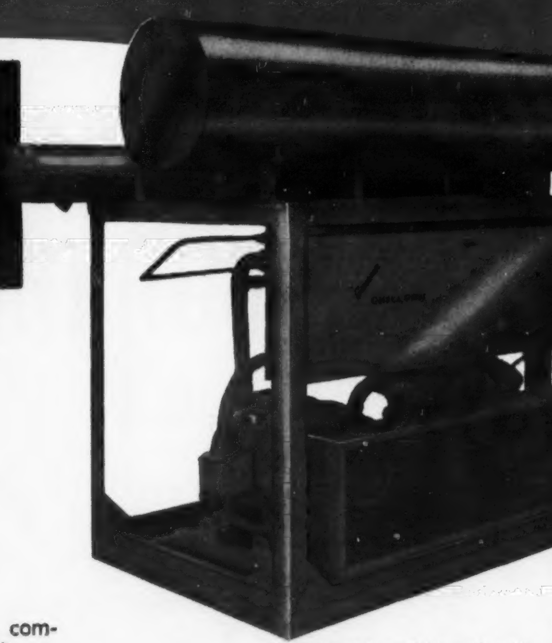
*(Concluded on next page)*

THE ALL NEW, COMPACT
CHILLPAK
SELF-CONTAINED CHILLER UNIT

SATISFABRICATED © BY GOVERNAIR

LOW

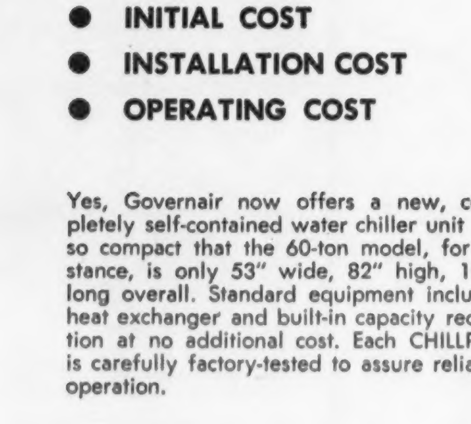
- INITIAL COST
- INSTALLATION COST
- OPERATING COST



Cabinet models available, with built-in or remote evaporative condenser.

Yes, Governair now offers a new, completely self-contained water chiller unit . so compact that the 60-ton model, for instance, is only 53" wide, 82" high, 101" long overall. Standard equipment includes heat exchanger and built-in capacity reduction at no additional cost. Each CHILLPAK is carefully factory-tested to assure reliable operation.

By using Governair's copyrighted "Satisfabricated" method, you can "design" your unit to **best** suit your specification and space requirements. Working from 10 basic models, over 68 flexible combinations . . . from 10 thru 120-ton capacity . . . are available. Write for details, or consult with your local Governair representative for the complete Governair "Satisfabricated" story.

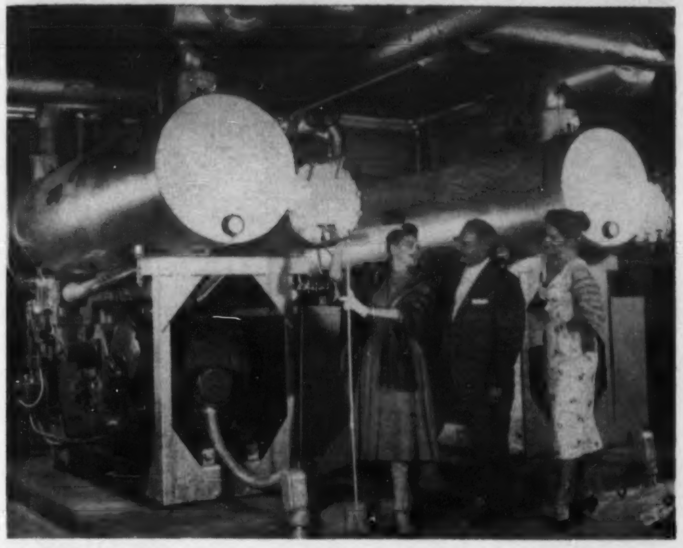


Governair's Air Unit Conditioners provide the perfect companion to the CHILLPAK unit, offering a complete range of capacities . . . from 3 thru 150 tons. Again, by using the "Satisfabricated" method, these units can be tailored to fit even the most unusual space limitations.

GOVERNAIR

ORIGINATORS OF COMPLETELY PACKAGED AIR CONDITIONING
4840 N. SEWELL, OKLAHOMA CITY, OKLAHOMA

**DURING THE PERFORMANCES** of the shows at the Dunes such as this one, 62 tons of refrigerating effect are delivered into the theater-restaurant by a blower delivering air at the rate of 19,000 c.f.m. Temperature is controlled throughout the entire hotel by a pneumatic type temperature control system. In the theater-restaurant a proportioning room thermostat with a full sensitivity adjustment re-sets a sub-master thermostat with its sensing element located in the coil discharge.



**GETTING THE "FEEL"** of the air conditioning system for Las Vegas' Dunes hotel are two members of the cast from the hotel's theater-restaurant show. F. G. Brown of Brown Air Conditioning Co., Las Vegas, explains that each of the two Worthington 150-ton packaged liquid chillers has three stages of unloading, giving six stages of cooling. This permits close proportional control throughout the building, depending on load conditions.

*(Continued from preceding page)*

On a typical night with the air conditioning equipment operating under a full load, 67 tons of refrigeration effect are distributed into the casino and adjacent cocktail lounge.

A series of fan and coil units installed in the attic with ductwork are equipped with manually operated dampers, to maintain any desired condition of air circulation between 100% fresh outside air, and 100% return air. During the early Spring and late Fall seasons the outside air is used almost exclusively for cooling.

Smoke and stale air are cleared from the various areas by means of exhaust fans.

During the performance of the shows, 62 tons of refrigeration are delivered into the theater restaurant by a blower at the rate of 19,000 c.f.m. Temperature is controlled throughout the entire hotel by a pneumatic type temperature control system.

### Controls for Theater-Restaurant

In the theater-restaurant a proportioning room thermostat with a full sensitivity adjustment resets a sub-master thermostat with its sensing element located in the coil discharge. This sub-master thermostat maintains a maximum high limit discharge temperature, and a minimum low limit discharge temperature.

The required discharge temperature is maintained by first modulating a heating coil mixing valve to by-pass hot water around the heating coil, and on a continued rise in temperature modulates a mixing valve on the cooling coil so that the chilled water is passed through the cooling coil.

Temperature control for the breakfast-dining room is maintained in a similar fashion.

### Details of Pneumatic System

Each of the Dunes' 200 guest rooms is controlled by individual room thermostats. Make-up air for the room conditioners contains fresh air that has been induced into the hallways. Approximately a half ton of refrigeration effect is delivered into each room.

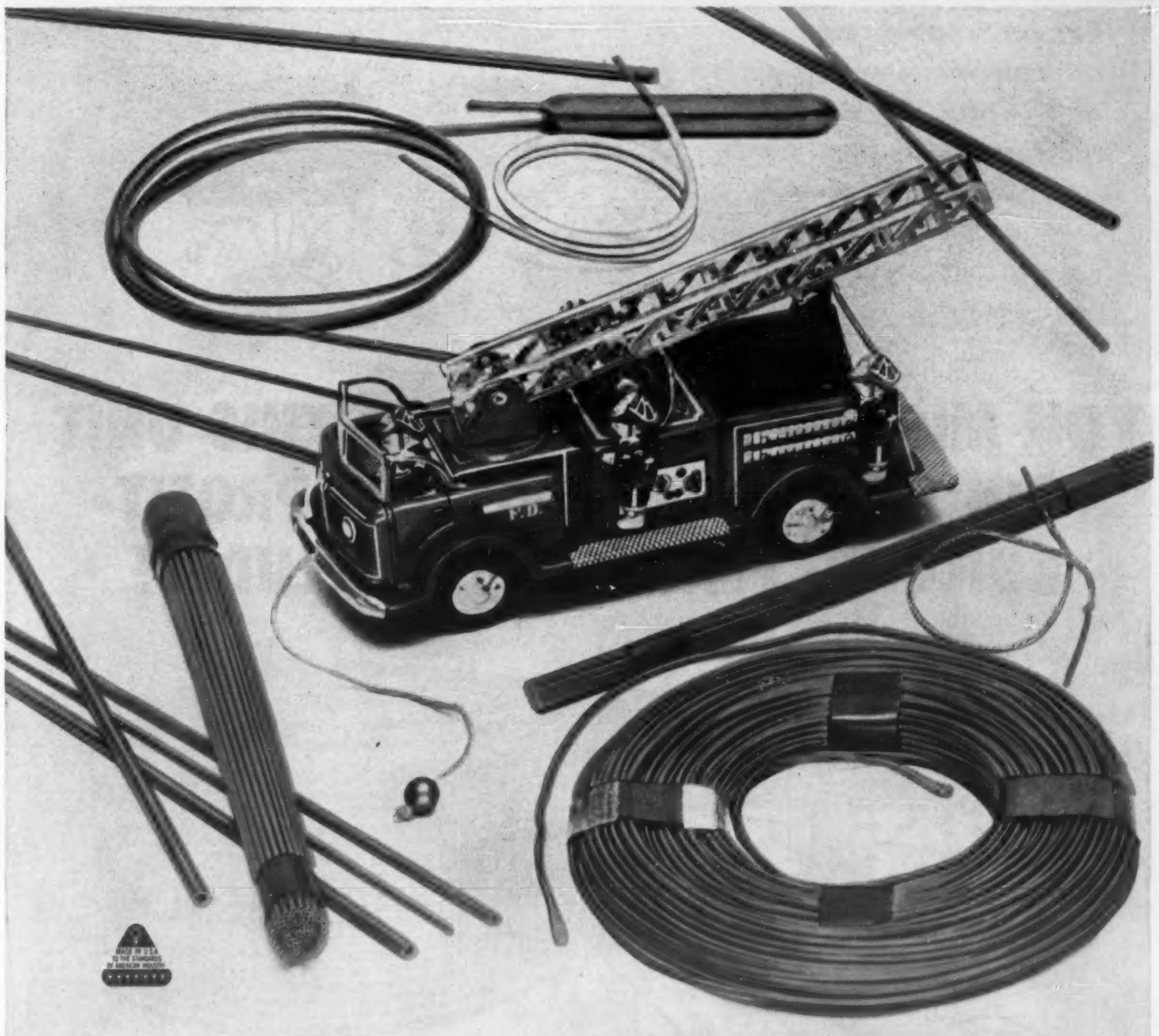
The pneumatic type temperature control system is operated from a ½-hp. compressor, operating on 70 to 80-lb. air pressure on its 20-gal. receiver, equipped with a pressure governor switch, and supplying through a pressure reducing valve assembly, 15-lb. and 19-lb. air to the control system.

For the primary hot water supply control, a remote bulb thermostat is located in the outside air, with the sensing bulb shielded from the direct rays of the sun. This instrument re-sets the control point of a sub-master thermostat with the sensing element located in the hot water supply to the units.

This sub-master thermostat maintains the required hot water supply temperature in accordance with the outside air temperature on modulating a three-way valve on the hot water supply line.

In certain special areas, such as dressing rooms and women's help areas, a manual heating-

*(Continued on next page)*

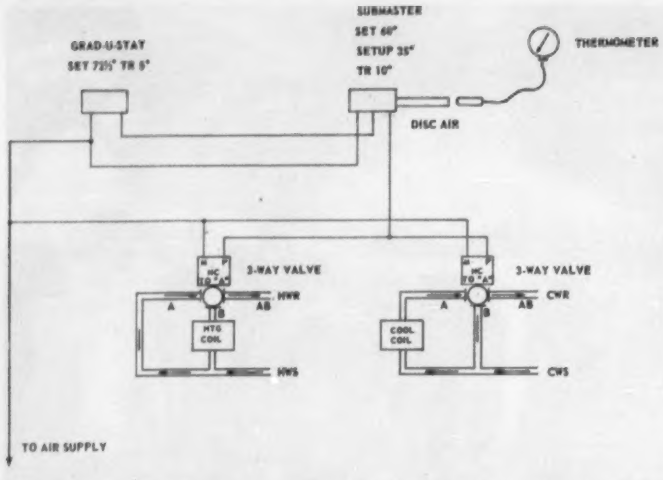


**KENSICO HELPS STOP FIRES BEFORE THEY SPREAD!**

Kensico's precision-drawn copper capillary tube does just that—as an *integral part* of one of today's leading automatic fire detection systems. Effective fire detection and prevention of fire loss is dependent on overall *tube quality* and workmanship. Close Tolerances. Inside Surfaces. Uniform Flow. Exact Specifications. Tube Cleanliness. Why not try Kensico for your *next small tube application?* Write now for Free Flow Charts. Engineering Consultation also available.

CAMBRIDGE, MASS. · BUFFALO, N. Y. · LINDENHURST, N. Y. · GOSHEN, N. Y. · ROSELLE, N. J. · PHILADELPHIA, PA. · PITTSBURGH, PA. CLEVELAND, OHIO · DETROIT, MICH. EVANSTON, ILL. · DURHAM, N. C. · FT. LAUDERDALE, FLA. · ST. PETERSBURG, FLA.

Kensico Tube
COMPANY INCORPORATED, MT. KISCO, N. Y.



PNEUMATIC control system for the Dunes hotel air conditioning system, with simplified drawing showing elements of control system, including sub-master thermostat, modulating control, and use of three-way valves on the water supply lines.

# Las Vegas--

*(Continued from preceding page)*

cooling change-over switch is provided for the pneumatic controls. This switch is located at the valve changeover station for the hot water and chilled water manual valves. When in the heating position, this switch supplies 15-lb. air to the controls, and when in the cooling position, the switch supplies 19-lb. air to the controls.

In certain other special areas, such as the offices, a heating-cooling room thermostat maintains required temperatures by operating with direct action to modulate the mixing valve in the coil.

SOME OF THE SHOWGIRLS from Las Vegas' Sahara hotel explore the workings of the two 100-ton capacity Worthington package liquid chillers which supply comfort cooling to 13 zones in the hotel. These include the theater-restaurant, cocktail lounge, casino, shops, offices, locker room, coffee shop, and stage.

At the Sahara hotel, Brown air conditioned the public rooms and office and special areas with two 100-ton Worthington package liquid chillers handling a total of 13 zones.

An idea of the requirements for the air conditioning of the various areas in the Sahara can be determined from the following key figures:

Theater restaurant — 24,000 c.f.m.; 930,000 B.t.u. per hour cooling effect, with 200 g.p.m. of chilled water, and fresh air supplied at 12,000 c.f.m.

Cocktail lounge—11,000 c.f.m., 430,000 B.t.u. per hour cooling effect, with 90 g.p.m. of chilled water, and fresh air supplied at 5,500 c.f.m.

Casino—15,500 c.f.m., 575,000 B.t.u. with 140 g.p.m., 7,500 c.f.m. fresh air.

Shops—4,000 c.f.m., 138,000 B.t.u. with 30 g.p.m., and 1,000 c.f.m. fresh air.

Offices—3,000 c.f.m., 107,000 B.t.u. with 25 g.p.m., 750 c.f.m. fresh air.

Locker room—2,000 c.f.m., 60,000 B.t.u. with 21 g.p.m., 500 c.f.m. fresh air.

Coffee shop — 5,400 c.f.m., with 160,000 B.t.u., 50 g.p.m. with 1,800 c.f.m. fresh air.

Stage—4,900 c.f.m. with 160,000 B.t.u., 35 g.p.m., 2,400 c.f.m. fresh air.

## Different Type System Used for New Frontier

A different type of system was installed by Brown in the New Frontier hotel, where the Worthington direct expansion cooling system was said to be the first of its kind installed in Las Vegas.

In the New Frontier system, Refrigerant-22 is piped to the fan room to four multi-zone fan and coil units, which furnish the heating or cooling to any one of the hotel's 16 zones. Each zone is controlled by room thermostats which control the zone dampers.

Each of the four major zones are controlled by remote bulb thermostats which determine whether heating or cooling is needed.

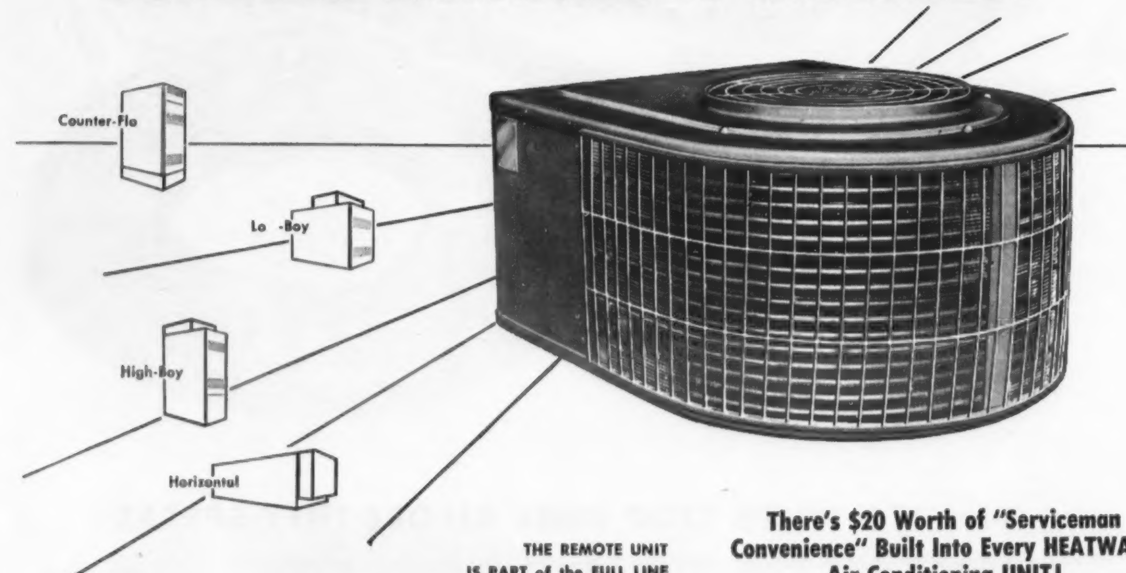
There is no return air ductwork as air is returned through ceiling diffusers which permits the use of the entire attic space as a large return air plenum. In order to do this, the underside of the roof area is insulated with 4 in. of Fiberglas insulation.

In order to take care of the fluctuating loads in the thousand-seat theater-restaurant,

*(Concluded on next page)*

**Service, repair and adjustments can sap profits and shrink markup! But the man who sells HEATWAVE (just look at this new waterless condenser) is SURE OF HIS MONEY!**

YOU MIGHT HAVE DESIGNED THIS UNIT YOURSELF . . . FOR ALL THE PROFIT-BUILDING FEATURES IT INCLUDES!



Packaged
Air Conditioner

THE REMOTE UNIT
IS PART of the FULL LINE
of HEATWAVE gas-fired FURNACES and matching
EVAPORATOR UNITS! To FIT EVERY HOME
from 60,000 to 160,000 BTU input.
Vertical hot air discharge allows shrubs
to grow alongside unit.
GET FULL, FREE INFORMATION ON THE
HEATWAVE LINE! . . . and the expanding
Heatwave sales program. WRITE TODAY!
Address Dept. "C."

We'll see you at the Show!

HEATING
HEATWAVE
AIR CONDITIONING

A Product of The Southwest Manufacturing Company, Aurora, Missouri
A Subsidiary of The F. E. Myers & Bro. Co., Ashland, Ohio
Manufacturers of The Famous Myers Pump

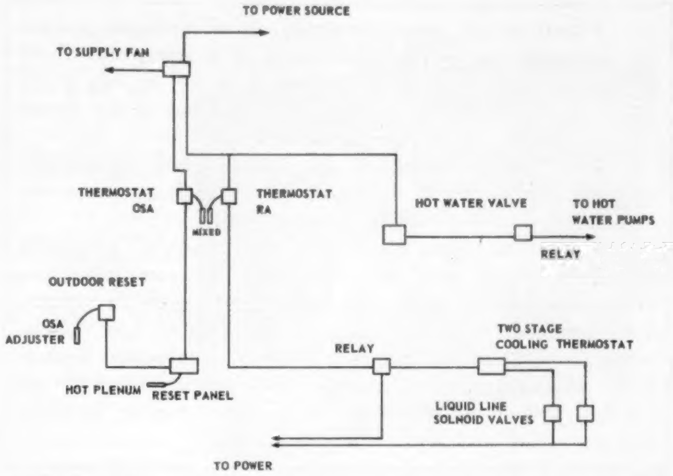
**There's $20 Worth of "Serviceman Convenience" Built Into Every HEATWAVE Air Conditioning UNIT!**

This new remote condenser for Heatwave Summer Air Conditioning is designed from the dealer-serviceman's viewpoint . . . to give maximum satisfaction AND PROFIT on every sale! The industry's best standard parts are used throughout.

It's EASY TO SERVICE with oil sight glass, detachable valves, liquid sight glass, moisture indicator and dryer all calculated to minimize problems.

THERE IS LESS MECHANICAL FAILURE due to a new, larger condenser face area which gives lower operating head pressure and lower liquid temperature.

HOMEOWNERS RECOGNIZE HEATWAVE SUPERIORITY and appreciate the lower operating cost!



DRAWING showing electrical control system, typical of one zone only, for New Frontier air conditioning system, which is direct expansion type on the cooling cycle. A mixed air thermostat activates either the direct expansion cooling system, or the hot water heating system.

*(Concluded from preceding page)* the fan room is arranged so that the return air from the casino area is mixed with fresh air to be used as the supply air for the theater-restaurant. The return air from the theater-restaurant is mixed with fresh air and becomes the supply air for the casino.

The four fan and coil units have a total capacity of approximately 60,000 c.f.m. and 20,000 c.f.m. of fresh air is used as supply air for the kitchen and then exhausted through various kitchen hoods.

Two fans mounted on the roof are utilized for quick smoke removal in the casino and theater-restaurant. Each fan is rated at 8,125 c.f.m.

### Combination Supply and Return Ceiling-Type Diffuser

The ceiling-type diffusers in the public rooms of the New Frontier are of the combination supply and return air type. The supply side is connected to the supply air duct system and the return air is just vented back into the attic space. This attic space becomes, in turn, a large return air plenum. The underside of the roof was insulated.

In the control system for the New Frontier installation, when the supply fan is in the "On" position, the control system is in operation. A mixed air thermostat upon a drop in mixed-air temperature below the predetermined setting, energizes a circuit to the reset panel which proportions the two-way hot water valve to maintain the desired hot plenum temperatures.

An outside air adjuster is provided to readjust automatically the hot plenum temperatures in accordance with outside air conditions. An internal auxiliary switch is provided in the hot water valve to start the two hot water pumps whenever any of the zone valves are in any position except full closed.

Should the hot plenum temperature be too low during mild weather, the setting of the reset panel may be raised a few degrees. Should the temperature, during mild weather, be correct but too warm during cold weather, the temperature reset dial may be lowered toward the decrease position.

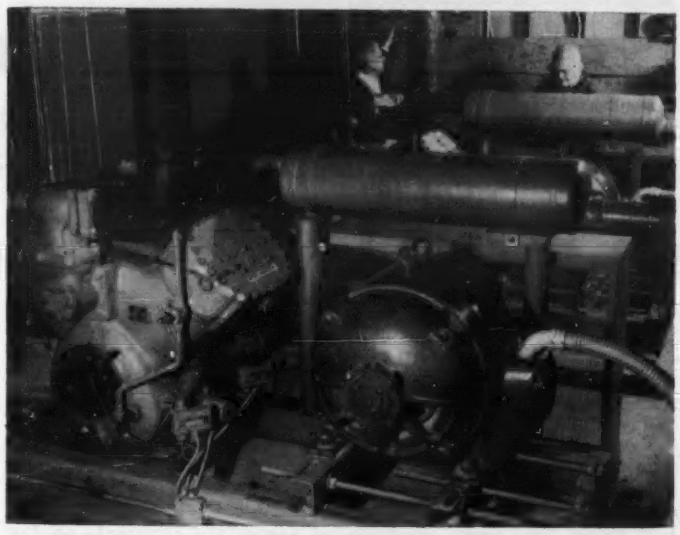
A mixed air thermostat upon a rise in mixed air temperatures above the setting, energizes a circuit to a two-stage cold plenum thermostat which cycles the first and second stage liquid line solenoid valves in sequence, upon a temperature rise to maintain the desired cold plenum temperature.

A room microtherm proportions the cold mixing damper motor to maintain the desired room temperatures.

For the refrigeration cycle control in the New Frontier installation, a suction pressure microtherm, runs the program switch to start the evaporative condenser fan No. 1, evaporative condenser pump No. 1, and compressor No. 1.

Second step in the control sequence energizes the 50% unloader solenoid valve. The third step energizes the 75% unloader solenoid valve and the fourth step energizes the 100% unloader valve in sequence upon a pressure rise.

A similar sequence is followed for the second compressor. A power failure relay is provided to stop the evaporative condenser pumps, fans, and compressor upon power failure.



SAID to have been the first hotel on Las Vegas "Strip" to use a direct expansion type cooling system, the New Frontier has two Worthington R-22 compressors, each developing 139 tons of refrigeration. The refrigerant is piped to the fan room to serve four multi-zone fan and coil units, which supply heating or cooling in any one of the hotel's 16 zones. Each zone is controlled through room thermostats which activate the zone dampers.

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28
YEARS OF FABRICATION
AND
REDRAW
EXPERIENCE?
H&H
HAS GOT IT
Originators and sole makers of METALFLO tubing
METALFLO
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H & H has experience not only in the fabrication of parts and tubing plus the redraw of tubing, but also in metallurgy, temper, grain size and dimension control as well. So if you can use experience like this—experience that is bound to make any good product even *better*—isn't it time you called your nearest H & H representative?

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# Diagnosing & Servicing Hermetic Compressors

## (1)

## Low Voltage and Moisture Are 2 of the Most Frequent Causes of Trouble In Refrigeration Systems

Warranties of some companies on refrigeration systems are voided by the simple service error of charging the wrong refrigerant into a system—R-22 instead of 12, or vice versa. Other warranties may be voided by the addition to the system of any alcohol or liquid dehydrant.

These are examples of the down-to-earth information presented in this series of articles on the analysis and service of hermetic and semi-hermetic compressors.

Written by Tom Pendergast, vice president, Employers Insurance Service, Inc., with more than 30 years' experience in manufacturing, selling, and servicing refrigeration systems, these articles will cover such basic problems as low voltage, refrigerant restriction, moisture removal, compressor replacement, evacuating, and charging. They supply quick review for the experienced serviceman and a comprehensive introduction to service techniques for the novice.

The replacement of hermetic compressors is costly and before they are taken out of a system the actual trouble should be determined. In a great many cases it is not the compressor that is at fault. A complete knowledge of the system is important and proper instruments are invaluable for proper diagnosis.

Many of the points covered in these articles are well known to installation and servicemen, but there are many students starting out in this work. Both old-timers and the newcomers will find some of the information informative and useful in their work.

### LOW VOLTAGE

Probably one of the most frequent causes of trouble in the operation of any refrigeration system is low voltage. For this reason, it is recommended that the serviceman carry an accurate voltmeter with him at all times.

If a doubt exists as to whether or not the compressor is getting the correct voltage, it should be checked.

The voltage should be checked across the terminals on the compressor to eliminate any possibilities of high resistance connections in the service line that may be giving trouble. Extension cords should not be used in permanent installations except in some cases when installing fractional horsepower units.

To get a true indication of the voltage, it is necessary to have all loads, appliances, etc., connected to the circuit during the voltage test. With all electrical apparatus operating, the refrigerating machine should be started, watching the voltmeter, and noting the lowest point to which the voltage drops.

If the voltage drops 10% below the rating of the power circuit, it should be considered too low and the necessary changes made to correct the condition before proceeding with any further service. Low voltage materially increases the power bill.

A low voltage condition may cause the following:

1. Unit will not start.
2. Unit overheating.
3. Unit cycling on thermoguard.
4. Burned relay and thermoguard contacts.

Low voltage may be caused by any one or a combination of the following:

1. Building wiring that is too light or overloaded by the addition of too many pieces of electrical equipment on the same circuit.
2. Loose or corroded terminals or connections in any fuse or switch box, loose or defective fuses, or a defective multibreaker.
3. Low voltage furnished by the power company due to overloaded distribution lines, transformers, or service entrance lines. The power company should correct.
4. Panels A, B, and E on the Airserco Analyzer Model 8000 (Fig. 1) provide means of checking voltage and amperes on 115-230 v. lines including balance of loads on three-phase circuits. There is a phase sequence indicator on Panel E.

The method taken to correct a low voltage condition will depend on the cause of the low voltage. If it is determined that the low voltage is caused by poor or overloaded wiring circuits in the building, an electrician should be called in to locate and correct the condition.

Low voltage will cause unsatisfactory or inefficient operation of almost all electrical appliances and apparatus, so that it is in the interest of everyone to see that low voltage conditions are corrected promptly.

### MOISTURE

The presence of moisture in a refrigeration system is one of the most common causes of unsatisfactory operation. In the case of refrigerants known as the "halogenated hydrocarbons" a limited amount of the moisture combines with the refrigerant and the rest of the moisture circulates with the refrigerant.

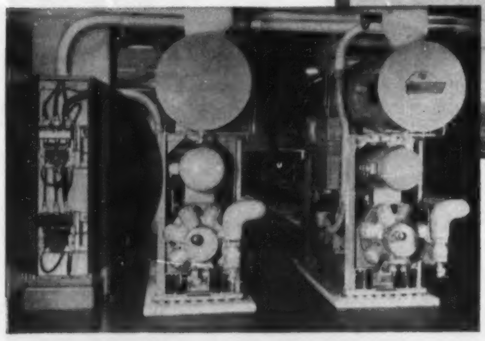
This free moisture continues to circulate in the system until it reaches a point where the temperature is below freezing and then ice crystals are formed and the refrigerant flow is restricted, erratic, or completely stopped. Moisture also causes copper plating of the compressor parts resulting in seizure, and a breakdown of the oil, forming sludge.

Moisture is introduced into a refrigerating system in any of the following ways:

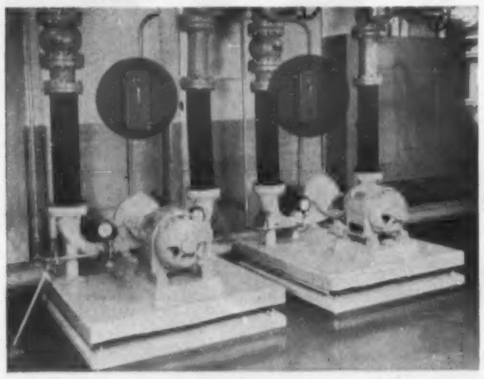
1. Refrigerant leaks in the evaporator or low side connec-

*(Continued on next page)*

The Hospital for Special Surgery,
New York City



One of the two A-B Bulletin 736 Size 5 part winding reduced voltage starters used with the 125 hp, 220 v motors for the packaged chillers.



This shows two A-B Bulletin 712 Size 2 combination starters for the 15 hp, 220 v condenser pumps.

Heating, Ventilating, and Air Conditioning Contractor: Kennedy-Scheidel and Young, Inc.; Engineers: Meyer, Strong and Jones.

Allen-Bradley Control was a "Natural"—because dependability was so important in this air-conditioning system

Each year more and more air conditioning consulting engineers select Allen-Bradley quality motor control because they *know* it will provide the dependable performance that they—and their customers—must have.

Allen-Bradley motor controls are reliable because they have the simplest operating mechanism yet devised . . . there is only ONE moving part. This solenoid construction—which only Allen-Bradley can furnish in *all* starters up through Size 8—is your assurance of years of trouble free performance. There are no bearings to corrode and stick . . . no flexible jumpers to wear and break. And the double break, silver alloy contacts are always in perfect operating condition . . . and *remain* so until completely worn away. In addition, all A-B starters have permanently accurate thermal overload relays that prevent motor burnouts.

You will obtain the motor control of *proven* reliability if you insist on Allen-Bradley. It's the motor control you can install . . . and forget!

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Galt, Ontario

A-B
QUALITY

ALLEN-BRADLEY
MOTOR CONTROL
QUALITY

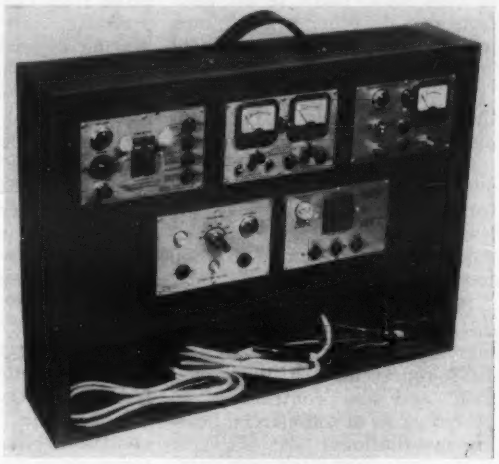

FIG. 1—Airserco Hermetic Compressor Analyzer & Electrical Tester, Model 8000. A basic service tool, as mentioned in the article, the analyzer is designed for use on 115 and 230-volt, single and three-phase circuits. Upper left panel provides capacitor and split-phase motor starter at 115/230 volts single phase and at 230 volts, three phase. Upper center panel has dual range volt-ammeter. Upper right panel contains a direct reading capacitor analyzer, 0-115 mfd and 0-575 mfd. Lower left panel is a high voltage non-destructive breakdown tester with visual and audible signal. Six testing voltages. Lower right panel is the three-phase tester with rotation indicator and triple overload protected switches.

* * *

*(Continued from preceding page)*

tions.

2. Lines being disconnected while the system is under vacuum or cold.

3. Introducing moisture into the system when charging refrigerant or oil that isn't dry, or when replacing parts.

4. System or compressor left open to the atmosphere.

The presence of moisture is indicated by long or continuous operation with little or no refrigeration and suction pressures that are much lower than normal. Many times, presence of moisture is confused with a defective expansion valve or a restricted strainer or capillary.

A simple way to determine if erratic operation is caused by moisture is to stop the compressor and warm all the parts of the evaporator to a temperature above 32° F. If normal operation is obtained when the compressor is then started and while operating above 32° F., it can be assumed that moisture is causing the trouble.

When working on a system in which Refrigerant-22 is used, extra precautions must be taken to be certain that the refrigerant-containing parts are really free from moisture. When there is moisture in a system, acid is created which gradually increases to where it breaks down the oil and causes copper plating of the moving parts and valves and later causes seizure.

In a Refrigerant-12 system erratic operation of the metering device usually warns of the condition and moisture is removed to make the system work.

In a Refrigerant-22 system the refrigerant will absorb about 50 times as much moisture by weight as Refrigerant-12 at -20° F. before freezing of the metering device which will indicate moisture in the system.

*(To Be Continued)*

## November Sales of Cooling, Commercial Refrigeration Distributors 4% above '57

WASHINGTON, D. C.—November sales of air conditioning and commercial refrigeration equipment distributors were off 14% from October but up 4% compared with a year ago, according to a wholesale trade report by the Bureau of the Census.

For the first 11 months of 1958, their sales were unchanged from the like period of 1957.

End-of-November inventories also were the same as a year earlier.

Compared with the end of October, inventories were down approximately 4%.

The Census Bureau report also indicated that sales of plumbing and heating equipment and supplies distributors in November declined 16% from October but rose 3% compared with November, 1957. Their sales for the first 11 months of last year were 5% under the corresponding 1957 period.

Inventories of these distributors at the end of November were down 2% compared with a month earlier and 1% lower than a year earlier.

SEE
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THE
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CALGON COMPANY
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
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This motor can drive anything...almost

This squirrel cage, open frame, integral horsepower Century Electric motor works fine on dozens of applications. You'll find it giving dependable low-cost service on blowers, fans, pumps, lathes, drilling machines and grinders. **But . . .**

**It can't do everything.** There are many applications where it won't give good results. That's why you can't use just any motor on your equipment. You need the right motor. The motor that gives you the right combination of torque, horsepower, acceleration and efficiency for you to get top performance from your equipment.

**Century Electric can help you get that right motor.** Here's why: Century Electric sales engineers are motor experts. They know motors and drive problems inside and out because they think, sell and apply motors and nothing but motors. They can sit down with you and give you on-the-spot answers.

**Over 10,000 types of motors** are available from Century Electric. There is one for every type of application and for any kind of operating condition—dusty, corrosive, explosive or moist. Century Electric sales engineers will help you select the right one. They don't have to rely on only a few types, like this standard squirrel cage motor, to do everything.

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# Residential Air Conditioning In Richmond

## *Growth Is Steady but Hardly Spectacular In 'Borderline' City; Survey Shows 294 Systems Installed In '58; Optimism High*

*By C. Dale Mericle*

RICHMOND, Va.—Popularity of residential air conditioning seems to be gaining here with a growth that is steady though hardly spectacular, as might be expected in this conservative "borderline" city.

A survey of leading Richmond contractors and distributors conducted by the NEWS turned up 294 residential installations made in 1958. This represents at least 75% or 80% of the home cooling jobs that went in here last year, it is believed.

Significant data obtained from eight contractors and four distributors is tabulated in the accompanying table. Additional background information was obtained from other firms and individuals.

### 5 Contractors, 1 Distributor Report Gains

Gains in air conditioning sales to homes over 1957 were reported by five of the contractors and one distributor. While none of these gains were large numerically, some more than doubled the 1957 records. Such increases could indicate an important and welcome trend.

Equally important, probably, is the general air of optimism about the future for residential air conditioning here—both immediate and long-range. Even the few firms whose sales were down or showed no increase in 1958 believe the local market has hardly been scratched.

Undoubtedly, the recession had some effect on 1958 sales of both cooling and heating even though most Richmond businessmen like to say the city hardly felt it. There is probably a strong factor of civic pride in this belief, for the same individuals also point out that the first quarter of 1958 was "mighty quiet."

### 1959 Starting Well

(In sharp and pleasant contrast, the first month of this year seems to be starting with a bang.)

Two events contributed to making Richmond's over-all 1958 record better than it might have been otherwise, however. Reynolds Metals and Seaboard Air Line Railway both moved their headquarters offices to Richmond in 1958, which meant the influx of some 1,500 or so families. Quite a number of these newcomers insisted upon air conditioning for their homes, according to some sources, and this sudden population increase also added to heating sales.

Three contractors and two distributors, for example, indicated their residential heating sales had gained over 1957, and all those engaged in commercial air conditioning and heating who had figures available registered gains in these fields as well.

Of the residential air conditioning installations 85 were sold to speculative builders, 55 were purchased by the buyers of new homes, and 106 went into existing homes. (This breakdown was not available from two distributors, but their sales were not large enough to make any significant changes in the above proportions.)

These same contractors and distributors also sold a combined total of 1,916 heating systems, nearly all of which were forced warm air jobs. There were 236 hot water systems included in the total, but only two heat pumps listed.

Most of these heating systems, 1,430 were installed in new homes, while 486 were installed as replacements in existing homes. A few represented year-round systems.

It is not known with full certainty whether the above figures on residential heating installations represent the complete picture for Richmond. Only contractors known to be active to some degree in residential air conditioning are listed in the tabulation, so no data appears for firms who have installed no home cooling systems.

The same precautionary note applies to the tabulation of figures on commercial air conditioning and heating. Although this listing includes some leaders in this field, there is no data from certain other firms known to be quite active in commercial installations.

Of the firms listed, however, the tabulation shows 112 commercial air conditioning installations and 81 commercial heating systems for 1958. One contractor lists his commercial air conditioning jobs by total tonnage, which amounted to 560 tons for the year.

Six of the contractors and one distributor indicated their commercial air conditioning jobs in 1958 represented a gain over 1957, and four contractors reported gains in commercial heating installations.

No information on this subject was available from three distributors.

Of special interest in the tabulation is the breakdown of percentage of dollar volume received by the eight contractors listed from their residential and commercial air conditioning and heating activities.

Only one contractor (No. 3) said all his volume came from the residential field—20% from air conditioning and 80% from heating. While this is technically correct, it should be noted that the individual heading this firm also has an interest in an entirely separate company serving both the residential and commercial fields.

Contractor No. 1 indicated that the biggest share of his dollar volume—65%— stems from residential air conditioning. He also lists 20% coming from residential heating, 10% from commercial air conditioning, and 5% from commercial heating installations.

Three contractors (Nos. 2, 6, and 7) show substantial gross dollar volume from "other"

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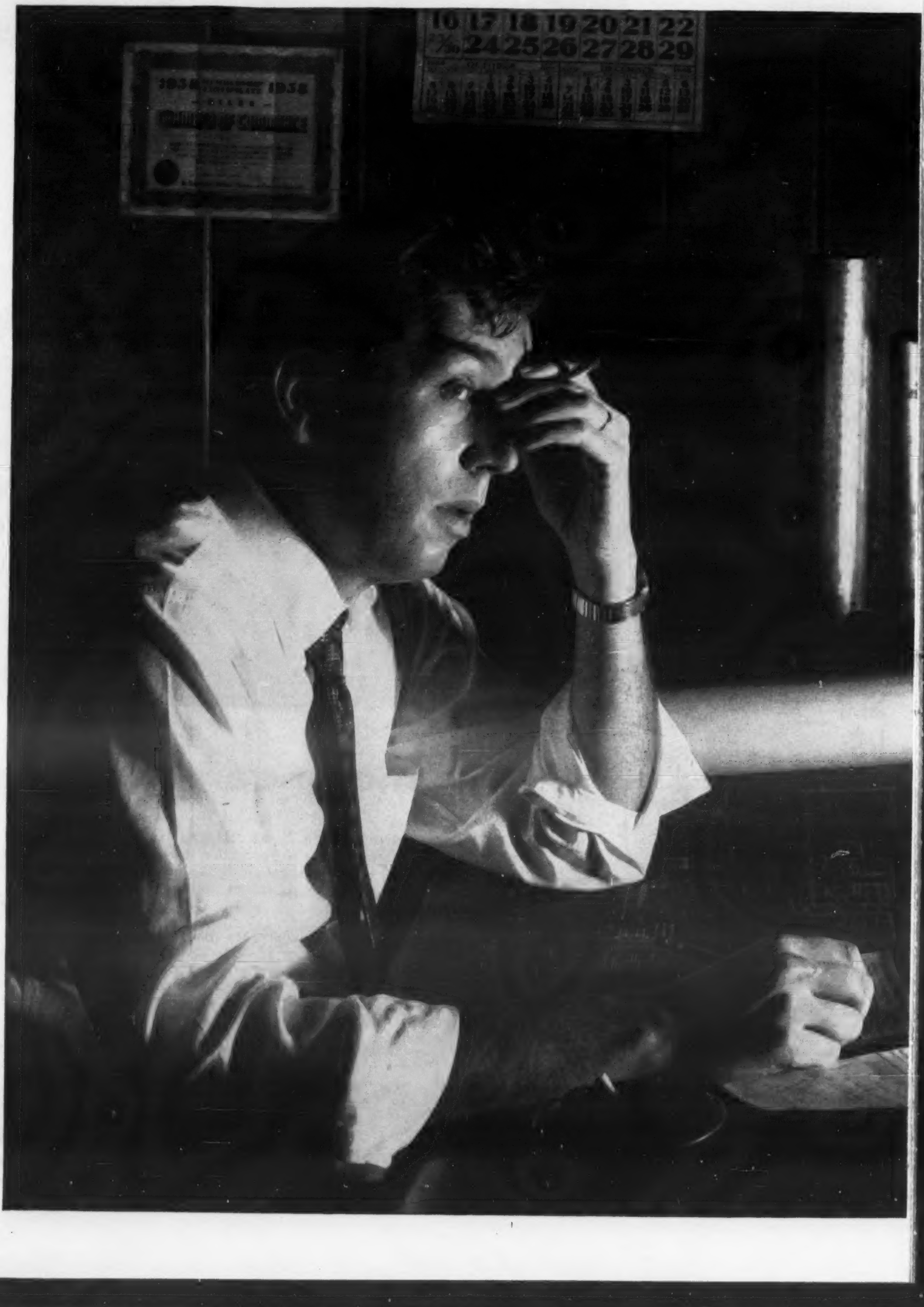

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activities. These include such fields as plumbing, commercial refrigeration, and roofing, though not necessarily in that order.

Two of these contractors (Nos. 6 and 7) and Contractor No. 8, find the greater part of their dollar volume in the commercial fields.

An attempt was also made in the NEWS survey to learn where the contractors normally obtain the equipment they sell. Contractor No. 1 regularly gets his units from a franchised distributor.

Contractor No. 3 gets his air conditioning units from an independent supplies wholesaler, but his furnaces come direct from the manufacturer. Nos 2, 4, 5, 6, and 7 usually obtain all their units, both air conditioning and heating, direct from the manufacturer. Contractor No. 8 uses all three of these sources.

This means, then, that approximately 107 residential air conditioning units came directly from the manufacturer to the dealer as compared with 146 units that went through franchised distributors (Contractor No. 1's total plus that of the four distributors), and 35 units from an independent wholesaler.

Another 30 residential air conditioning units are known to have gone through a franchised distributor, but these were not listed in the accompanying tabulation because they might have distorted the over-all picture.

It was also determined that the first six contractors listed maintain warehouse stocks of air conditioners and furnaces. Only contractors Nos. 7 and 8 do not.

As for the brands of residential air conditioners involved, 16 different makes are represented in the 294 Richmond installations. Of these, seven are "old line" air conditioning and refrigeration manufacturers with a total of 132 units, and nine are furnace manufacturers with 162 units.

## How Richmond Residential Contractors Fared In 1958

| Con- | —Residential Cooling— | | | | Residential | | | | —Percentage of Dollar Volume— | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| trac- | 1958 | –New Homes– | | | Heating | | Commercial | | Residential | | Commercial | | |
| tor | Total | Bldr. | Buyer | Exist. | New | Exist. | Cool. | Htg. | Cool. | Htg. | Cool. | Htg. | Other |
| 1 | 65* | 45 | .... | 20 | 45* | 10* | 6† | 4† | 65% | 20% | 10% | 5% | ........ |
| 2 | 48† | 20 | 8 | 20 | 300† | 20† | 18† | 25† | 10% | 20% | 8% | 10% | 52% |
| 3 | 35† | 2 | 15 | 18 | 450† | 50† | .... | .... | 20% | 80% | ........ | ........ | ........ |
| 4 | 23* | 14 | 9 | .... | 64* | 4* | 16† | 15† | 12% | 52% | 20% | 16% | ........ |
| 5 | 20† | 3 | 3 | 14 | 10† | 40† | 5‡ | .... | 20% | 28% | 6% | 5% | 41% |
| 6 | 10 | .... | .... | 10 | .... | 20 | § | 15 | 5% | 5% | —55%— | | 35% |
| 7 | 6† | 1 | .... | 5 | 1* | 1* | 45† | 22† | 5% | 1% | 80% | 4% | 10% |
| 8 | 6† | .... | .... | 6 | .... | 1* | 12‡ | .... | —10%— | | —80%— | | 10% |
| Dist. | | | | | | | | | | | | | |
| A | 30 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| B | 25† | .... | 20 | 5 | 360† | 240† | 10† | NA | NA | NA | NA | NA | NA |
| C | 18* | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| D | 8* | .... | .... | 8 | 200† | 100† | .... | .... | NA | NA | NA | NA | NA |
| Total | 294 | 85 | 55 | 106 | 1,430 | 486 | 112 | 81 | ........ | ........ | ........ | ........ | ........ |

*Down from 1957. †Up from 1957. ‡Year-round. §Total 560 tons, up from 1957.

No exceptional amount of advertising and promotional effort has been employed by Richmond contractors to sell residential air conditioning, judging by the comments of the eight firms listed in this survey.

All of them use the telephone book "yellow pages" to some extent, but most of the advertisements are small. Five contractors noted that newspaper advertising is used occasionally; one has used some radio; three have used direct mail; one also distributes a calendar.

In general, the contractors depend mostly, if not solely, on "word-of-mouth" advertising, they say.

Whether sales of residential air conditioning might have been greater if this "better mousetrap" approach to advertising and promotion did not prevail, as it seems to in Richmond, is perhaps a matter of conjecture. One experienced engineer who recently came to Richmond from a nearby city where residential air conditioning is quite popular flatly declared that "Richmond is about five years behind" in the public acceptance of air conditioning, at least for homes.

"Too few contractors are really trying to sell air conditioning," another suggested. "They merely leave a price with the prospect; they don't try to sell them," he added.

"I'm not a good salesman myself," this contractor commented, "but I do try to explain to prospects what the installation will do for them."

This firm, according to its spokesman, doesn't cut prices but still gets lots of jobs even though it's the highest bidder.

"Too many contractors are merely cutting prices instead of trying to sell at a profit," he complains. He also reveals that "we do very little business with general building contractors because we usually have to 'finance' them. We have to wait a long time to get paid."

There may be some doubt as to whether this contractor is as poor a salesman as he claims.

"When trying to sell a job, if there's something about the installation that's going to be a bit bad," he said, "I make it sound worse than it will actually be. Then the customer is pleasantly surprised when the job turns out so well."

Another contractor thinks he has an important sales approach in his "sticking to rectangular ducts rather than using extended plenums and round ducts even though it runs $50 to $60 more with rectangular ducts."

The latter result in much quieter systems, he claims.

What happens when the "honeymoon" is over?

Promises come a lot easier than fulfillment!

Heating and air conditioning dealers soon find that the paid vacations and other special inducements offered by different manufacturers fade into memory along with the rose-hued words of courtship. Suddenly you're faced with the stark reality of making money with the line you're handling. What then?

That's when the "ordinary" things become all-important . . . the backing you get from the factory, the sales helps, the training schools for your men, freedom from shipping errors, the many ways a manufacturer can help you sell more efficiently and make more money.

With Lennox there are no gimmicks, no verbal smoke screens or razzle-dazzle —just an honest effort to help our dealers make money the year 'round—every year.

If *you* want help instead of promises, it will pay you to investigate Lennox now. It's the line designed for the long pull.

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Marshalltown, Iowa • Columbus, Ohio • Syracuse, N.Y. • Fort Worth, Texas
Salt Lake City, Utah • Decatur, Ga. • Los Angeles, Calif. • Des Moines, Iowa
Lennox Industries (Canada) Ltd. • Toronto, Montreal, Calgary and Vancouver

# TECHNICAL CENTER

*By Frank J. Versagi, Technical Editor*

## Air Distribution—Zoning

Poor air distribution can undo the effect of the most carefully designed cooling or heating plant—small or large, industrial, commercial, or residential.

And there are times when proper air distribution means **zoning.** By definition, zoning is the division of the conditioning or heating system into sections to permit independent control of room conditions in the zone served by each section, whether the load in this section is fluctuating or steady.

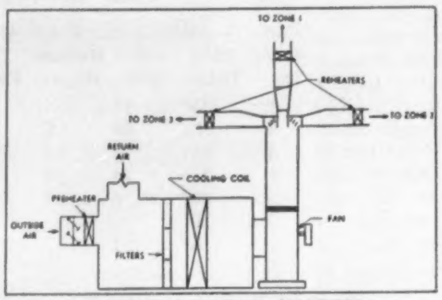
All zoning methods are costly and the designer must justify in his own mind that the added expense is compensated for in improved performance.

This technique may be required where building exposure, orientation, or usage is such that the conditioning system must compensate for fluctuating or steady loads which are independent and unrelated, and occurring in different portions of the building. As an example, office buildings, during mild winter weather, spring or fall, may require cooling on the sunny side and heating on the shady side; this is accomplished efficiently only by zoning.

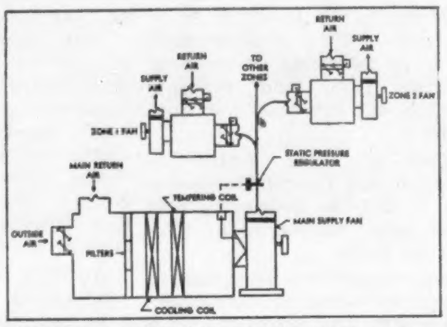
There are five basic methods of zoning air distribution in an air conditioning system:

1. separate system for each space,
2. simple reheat system,
3. separate recirculating fans system,
4. volume control system,
5. double duct system.

Basic characteristics of these five systems are described in an Application Manual issued by York Corp., and the information in this article is derived from the York publication.



SIMPLE REHEAT SYSTEM



SEPARATE RECIRCULATING FAN SYSTEM

### 1. SEPARATE SYSTEM FOR EACH SPACE

While obviously offering maximum flexibility, the separate system for each space technique must be sized for maximum design load of each zone so that the total for all zones is larger than central station apparatus capacities sized only for the building simultaneous maximum design load.

Where hot or chilled water is the heat transfer medium, and is zoned, simultaneous heating and cooling of different zones is independently possible.

The separate system may be adapted to central station equipment where one central station serves areas on one or several floors having nearly uniform load characteristics—this fact allowing them to be combined to constitute a single zone.

Forced air heating or direct radiation heating (with tempering of ventilation supply air) may also be adapted to the separate system of zoning.

High in first and maintenance costs, the separate system's ability to meet load variations tends toward economical operating costs when power, steam, and water are considered.

### 2. SIMPLE REHEAT SYSTEM

In the simple reheat system of zoning, the air is cooled sufficiently to satisfy the space having the most rigorous requirements, then reheated for other spaces. The reverse may be accomplished with **recooling.**

Reheat is accomplished by steam, electricity, gas, or condensing unit hot gas. Since this system consumes energy in removing heat from the air and then consumes more energy in adding heat back into the air, it is somewhat wasteful.

Condenser reheat method is the least wasteful since it wastes compressor power only.

Capacity and power requirements of the reheat system refrigeration plant must satisfy the sum of the maximum peak loads for the individual spaces rather than the maximum peak of the building, and no compressor capacity reduction is possible as internal sensible load decreases.

Advantages of the simple reheat system are excellent flexibility under varying loads, simple and positive control. The method is most suited to industrial applications where benefit to product or process often overcomes operating and first cost objections, and where power and steam costs are relatively low.

### 3. SEPARATE RECIRCULATING FAN SYSTEMS

In this method of zoning, a central station conditioning apparatus supplies air to multiple recirculating fans, one to a zone.

Automatically controlled mixing dampers mix the correct proportion of conditioned and recirculated air to meet the zone load requirements. Heaters may be supplied at the zone fans for refinement of summer zone control by reheat, but this is seldom done on comfort jobs since satisfactory control is usually obtained by by-passing action of increased recirculated air under reduced loads.

*(Concluded on next page)*

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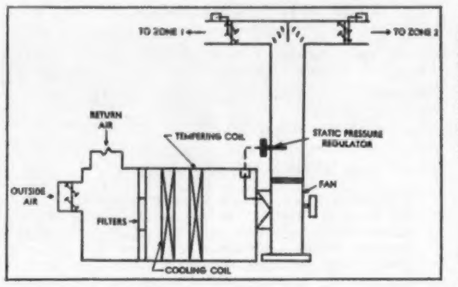
VOLUME CONTROL SYSTEM



*(Concluded from preceding page)*

Zoned winter heating may be by building direct radiation with tempering of the ventilation supply air at the main conditioning apparatus.

This recirculating fans system is quite flexible in meeting fluctuating loads and offers the major feature of the separate system for each space while having a lower first cost usually. The system has been successfully applied to large office buildings.

One objection to the system is that while total air supply remains constant, ventilation air decreases as the conditioned air mixing dampers throttle on reduced load.

Space limitations often hamper effective filtering of recirculated air. And the added cost of filters to provide sufficient filter area to permit recirculating or by-passing at reduced load is frequently an economic objection.

## 4. VOLUME CONTROL SYSTEM

Here is a very simple method of zoning merely by throttling the air supply to a zone or space with an automatic damper. In combination with the third method, volume control has proved successful for handling major variations in load and temperature regulation.

In one type of combination, the recirculating fans serve all the zones on a floor—one or two fans to a floor—with volume dampers accomplishing the individual area zoning required on each floor.

Heating by zoned direct radiation with tempering of supply air for ventilation is recommended for volume control systems.

If summer reheat is desired, heaters must be installed at the volume dampers.

Lower in first cost and comparable in operating cost to other methods, the volume control system nevertheless suffers from inherent disadvantages which must be considered:

A. ventilation is reduced with supply air reduction as the load falls off,

B. less dilution effect on room odors like tobacco smoke,

C. throttling of the air disturbs distribution—often making occupants aware of changes because of alterations in air motion or noise level,

D. outlet grille velocity reduction decreases throw and may cause the cooled air to drop into the occupied zone, creating a draft,

E. requires the complication of static pressure regulation at the fan to prevent increased air volume in one zone as a result of throttling in another.

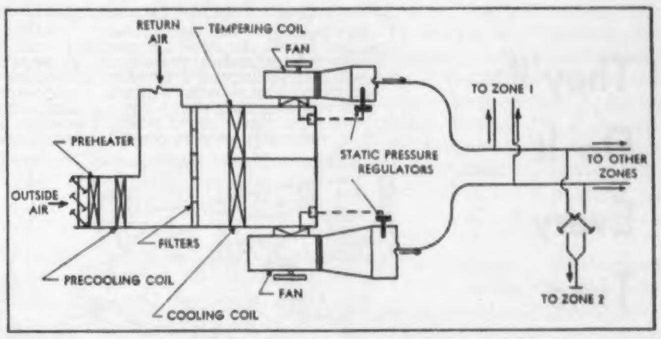
Volume control systems have been most successful where the design contemplates the volume dampers compensating for minor load variations only, with volume regulation limited by stops on the dampers to 25-33% maximum reduction. With volume control, air cooling and refrigeration capacities can be sized for the entire building maximum simultaneous load.

## 5. DOUBLE DUCT SYSTEM

Rapidly increasing in popularity, the double duct system of zoning consists of two supply ducts carried to each zone or individual space, one supplying cooled air and the other warm air — with automatic mixing dampers at the supply outlets. The two ducts are served by central station heating and cooling plants, either with separate fans or with a single fan blow-through system.

Static pressure regulation at the fans is required.

Although relatively more costly than other systems, performance of the double duct system is such that it is highly recommended for multi-room applications, since its flexibility allows it to carry the extreme application of control for each individual space, saving operating cost.



DOUBLE DUCT SYSTEM

Supply and ventilation air quantities are approximately constant at all loads, and effective filtering of all air is practical. Simultaneous heating and cooling of different zones or spaces is possible, and summer reheat is readily available if needed.

Thermostats controlling the mixing dampers need not be reversed in changing from heating to cooling, or vice versa.

Air cooling and refrigeration plant capacity is determined by the maximum simultaneous building load, rather than the sum of maximum zone loads.

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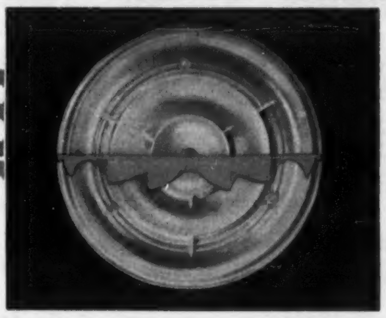

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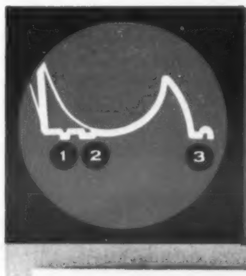

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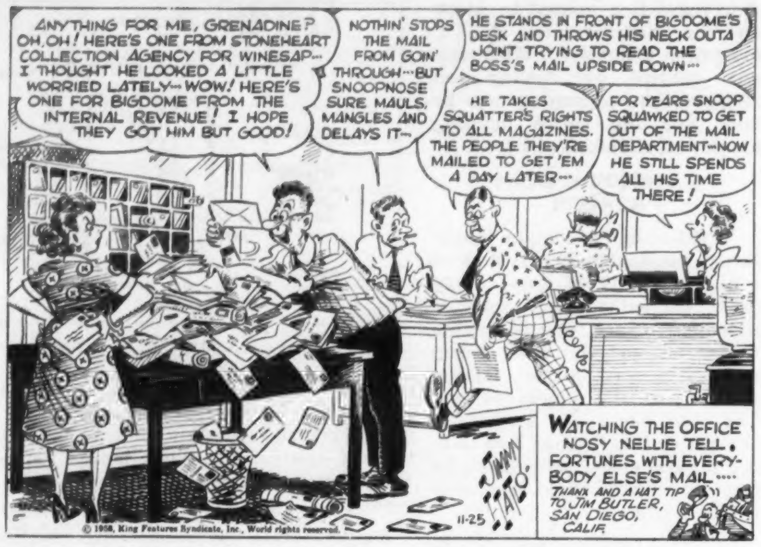
## They'll Do It Every Time

by

Jimmy Hatlo


ANYTHING FOR ME, GRENADINE? OH,OH! HERE'S ONE FROM STONEHEART COLLECTION AGENCY FOR WINESAP... I THOUGHT HE LOOKED A LITTLE WORRIED LATELY... WOW! HERE'S ONE FOR BIGDOME FROM THE INTERNAL REVENUE! I HOPE THEY GOT HIM BUT GOOD!
NOTHIN' STOPS THE MAIL FROM GOIN' THROUGH... BUT SNOOPNOSE SURE MAULS, MANGLES AND DELAYS IT—
HE STANDS IN FRONT OF BIGDOME'S DESK AND THROWS HIS NECK OUTA JOINT TRYING TO READ THE BOSS'S MAIL UPSIDE DOWN...
HE TAKES SQUATTER'S RIGHTS TO ALL MAGAZINES. THE PEOPLE THEY'RE MAILED TO GET 'EM A DAY LATER...
FOR YEARS SNOOP SQUAWKED TO GET OUT OF THE MAIL DEPARTMENT—NOW HE STILL SPENDS ALL HIS TIME THERE!
WATCHING THE OFFICE NOSY NELLIE TELL, FORTUNES WITH EVERYBODY ELSE'S MAIL....
THANX AND A HAT TIP TO JIM BUTLER, SAN DIEGO, CALIF.
JIMMY HATLO
11-25

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# Merger of Heating and Refrigerating Engineers Seems Timely and Promising

THE KING IS DEAD! LONG LIVE THE KING! Thus the British announce the end of one royal regime and the beginning of another. It's an admirable attitude—in its evidence of continuity, its respect for the past, and its hope for the future.

***In the United States of America*** losers of a political contest (including voters whose candidates weren't elected) accept the results with pretty much the same attitude. The majority has spoken and, well . . . let's go on with the show.

Surprising bitterness was generated by the pre-voting campaign maneuvers of opponents and proponents of the merger between the American Society of Refrigerating Engineers and the American Society of Heating and Air Conditioning Engineers last month.

Now that emotions have had time to subside, however—after all, the merger *was* approved by substantial majorities — it would seem wise on the part of all concerned to forget whatever whom said about what in the heat of battle.

***The losers must accept*** an accomplished fact. Winners, charitably, should neither gloat over nor condemn those who opposed them. This is the way of democracy. Let's get on with the show! Let's put the show on the road!

Where do these amalgamated engineering societies go from here? Why, ahead, of course. Gates have been opened to broaden their areas of activity.

***Mr. Heat has married*** Miss Refrigeration, to legitimatize their son, Air Conditioning.

In certain specialized aspects, refrigeration and heating would appear to involve opposing (or, at least entirely different) problems. Actually, though, they're just two sides of a coin which can be flipped easily.

They comprise the *science of temperature control and its practical applications.*

Sensibly, in biggest and broadest terms, heating and cooling are blood relatives. Indeed, one could suggest that the merged groups some day will rename their organization (for greater simplicity and accuracy):

*"American Society of Temperature Engineers."*

At present, of course, the mere fact of approved amalgamation does not guarantee quick progress toward the enlarged goals envisioned by these engineers and their more numerous affiliate members (sales representatives).

Truly, those who will be involved with technical details of the merger foresee all sorts of minor difficulties in making this marriage work, especially at local levels. However, it *will* work, because the idea itself has manifest destiny.

***Perhaps the biggest*** plus value which will be realized soonest is the *saving of time* of all concerned. That will accrue from eliminating duplication of meetings, committee effort, etc.

It is hoped and trusted that said time-saving on the part of engineers will be reinvested into heightened industry progress. Best avenue for reinvesting this time-element:

*Research!*

Although the ASHAE has waged noble efforts as to cooperative research programs in the past, ASRE has done little in this regard. The bigger, combined ASHRAE now has a great opportunity to "wrap up the whole ball of wax."

***Take that basic item,*** the refrigeration compressor—which is the heart of every air conditioning and refrigeration system. There hasn't been a new compressor design in 30 years. Mutual components (especially motors, blowers, and controls) need a dash of imagination, also.

Long run, then, the inevitability of this amalgamation *ought* to beneficiate nearly everyone concerned. Especially if it leads to practical research.

***There's a tremendous future*** ahead for the rapidly combining (on every level from manufacturing to selling to servicing) heating, plumbing, refrigeration, and air conditioning industries. Each needs the other. All will grow together.

ASHRAE's research efforts—if and when they come—can help the whole world live better, happier, and *at peace.* Comfortable people don't start wars.

---

If folks used as much effort staying slowed down as they do speeding up, the grave yard would have fewer folks in it.—*Fifth Wheel.*

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*'The Conscience of the Industry'*

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"If you think the editor sometimes makes a mistake in what he gives you to read, you ought to see the mass of stuff from which he saves you."—*Karl A. Bickel,* former president of the United Press.

OFF THE CHEST

## BILL NESSELL LIKES BEING COMPARED TO EDITOR

Minneapolis-Honeywell
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Minneapolis 8,

Editor:

I am sure that you do not know me, and I know you only through reading the excellent stories and editorials you write for the NEWS. I wish that we really were acquainted because I have a hunch that we see eye to eye on many of the problems confronting the heating and air conditioning industry today.

I would like to tell you of an experience I had after giving an address to a technical group in Dallas, Texas, that I think is a compliment to both of us. At the conclusion of the meeting a man came storming up to the platform where I was still standing and stated in no uncertain terms that he did not like what I had said. His comments went something like this—

"Bill Nessell, I am not going to tell you that you gave us a good talk tonight. All that you and that guy George Taubeneck in Detroit say is what the dealer is doing in selling and installing heating and cooling in houses."

Frankly I was pleased to be placed in the same classification with you. Maybe if we open "our big mouths" more and holler louder we might be able to get under the skin of some of those in our industry that are taking some of our homeowner customers for a ride. On the other hand, maybe their skins are too thick to be punctured.

C. W. NESSELL

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**

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NEWLY elected officers of the Dallas Air Conditioning & Refrigeration Contractors Association are: Bob Kilpatrick (Carrier-Bock Co.) president; Mack Dring (Dring Engineering) secretary-treasurer; Travis Parker (Joe Hoppe Co.) vice president. At far right is Bill Steinle (Matthews Engineering Co.) retiring association president.

# Dallas Contractors To Emphasize Activity Of 'Watch Dog' Committee During 1959

DALLAS — Successful operation of its "Watch Dog" committee, which checks the quality and safety feature of air conditioning equipment installed by its members, has resulted in plans for new emphasis on this activity in 1959, the Dallas Air Conditioning & Refrigeration Contractors Association reports.

The committee was set up last year to assure the buying public of the quality as well as the safety of installation of equipment sold by its contractor members. It judges the installation against the association's own standards.

Members of the committee will change each month and the "Watch Dog" group will inspect at random installations of members and non-members for conformance with association standards. The committee also investigates jobs reported by customers to Col. John A. Smith, Jr., executive secretary.

R. M. Kilpatrick, Carrier-Bock Co., is the new president of the Dallas Air Conditioning & Refrigeration Contractors Association, succeeding William Steinley, Matthews Engineering Co., who becomes board chairman.

Other officers named to take office with the change in calendar were Travis Parker, Joe Hoppe Co., vice president; M. L. Dring, Dring Engineering Co., secretary-treasurer; Robert Burns, Dallas Air Conditioning Co., Beverly Randolph, Ranger Air Conditioning Co., and Bob Frymire, Frymire Engineering Co., board members.

Program plans for the year have been based on a survey of members. This indicated a strong desire to upgrade the engineering, installation, and service standards in the Dallas area through an association of better informed members, and a better informed buying public.

# Gonzales Warns Against Effort To Standardize Heat Load Calculations

COLUMBUS, Ohio—"It would be inconsistent to attempt to standardize heat load calculations unless we are also able to standardize people."

Discussing heat load calculations, Ralph A. Gonzales, director of technical services, Airtemp Div., Chrysler Corp., declared at a meeting of service engineers that "We must not attempt to calculate heat loads with fifth decimal place accuracy."

Explaining that the sources of heat are the envelope, internally generated heat, and ventilation load, Gonzales insisted that there is no perfect heat calculation method. The true measure of whether an air conditioning system has been sized correctly is the comfort of the customer. He then ran quickly through heat load calculation forms, explaining briefly the several calculations and factors involved.

"Most such forms contain all the explanatory information needed to allow the intelligent serviceman to determine heat loads with practical accuracy," he stated.

Gonzales then projected slides showing several locations for grilles and diffusers mentioning that each has advantages and disadvantages. One point he stressed was that temperature differential between floor and ceiling of 17° have been measured where a piece of furniture was placed directly in front of a low-wall cool air grille.

He also touched upon the relative merits of air-cooled and water-cooled air conditioners. Standard tests for air-cooled condensers require that tests be conducted with a 95° F. entering air temperature. In practical application, however, 95° average is never obtained in most parts of the country, he explained.

Where actual comparison tests were made on identical operating units equipped with water and air-cooled condensers, the unit capacity and power consumption were found to be "not significantly different."

**"Corrosion." By Frank J. Versagi—50¢ each.**

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3. *No Kinks or Entanglements*—thanks to the special way the tube is wound on reel.
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5. *Work Saved*—new type Chase reels are easy to handle, lighter in weight. No storage problems of empties, no inventory, no returns to keep track of. Just throw them away.

You can get Chase copper refrigeration and air conditioning tube on the new disposable reels in ⅜", ½" and ⅝" OD sizes, lengths from 400 to 3,000 ft. For standard or specially-designed reels, ask your nearest Chase warehouse or District Office—or write Chase at Waterbury 20, Connecticut for full information.

New cardboard disposable reels on assembly line at Anheuser-Busch Refrigerated Cabinet Division plant. Note large 16" arbor hole in reel specially designed by Chase to meet customer's specific needs.

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# 'Organize for Growth or Die'

## *President of Firm Doing 40 Times Volume of 12 Years Ago Offers Some Pointers on Proper Organization*

*By Milton I. Schwartz, President,*
*S. & M. Schwartz & Co., New York City*

There isn't a man reading this page who has not been or soon expects to be faced with the problem of reorganizing his company, division, or group to handle a larger volume of business.

Milton Schwartz, president of S. & M. Schwartz & Co., has watched his commercial refrigeration distributorship grow to handle 40 times the volume it did 12 years ago in the highly competitive New York City market.

In an outstanding talk before the National Commercial Refrigerator Sales Association, he told, out of his own experience, what it takes to organize for growth. Reproduced here, almost in its entirety, is his counsel.

In today's competitive market, in my opinion, a company will either properly organize for growth, or will stagnate and die.

Proper organization provides for effective, well balanced performance of all work that must be done to carry out the plans of management. Organization planning helps to streamline operating activities, provides for balanced and effective management, and eliminates possible overlap, duplication, and personnel frictions.

With good organization, every man will know his job, and his responsibility for both short and long range planning.

The proper kind of organization will stimulate initiative and creative effort by requiring managers at all levels to make management decisions and broaden their range and capacity.

Organization facilitates growth and expansion. Some companies grow in a series of disruptions, periodically upsetting personnel and the existing organization. Organization planning, properly undertaken, will eliminate many of these disturbing influences.

Every company starts out with a functional organization struction because this is a simple, direct, and economical way to organize. Sooner or later, however, the enterprise outgrows this type of structure. As the functional organization grows, it can increase only by adding additional layers to the pyramid that goes to make up each function.

The first check list for change, it would seem to me, should be:

1) Delegate authority,
3) Build controls,
3) Develop managers and, most important,
4) Give it *time*.

**The most important asset that a company can have is a good chief executive officer. The greatest liability is a poor one.**

To achieve any goal requires paying some price, so it would be unrealistic to design a plan which required a price higher than the chief executive is willing to pay.

For example: An executive approaching retirement may be unwilling to undertake things that a younger man would do. Some executives are willing to risk delegating substantial authority to subordinates—others are more cautious.

Some are willing to take steps that are contrary to the personal interest of even closest friends if this is in the best interest of the organization.

Others have such deep loyalty to individuals that they cannot brings themselves to act critically towards these individuals even when the good of the business calls for it. **This is most dangerous.**

It is also essential that the top man understand and be prepared to do what he must do to make the plan a success. If he does not carry out his part, resistance and inertia down the line will increase. In such cases it would frequently have been better never to have undertaken the plan at all.

So, in making a change towards reorganization, it is necessary to answer such questions as,

1) How much change must a good executive make?

2) Is he adaptable?

3) Will he set a good example?

4) Does he really understand and feel strongly about the new approach, or does he recognize the need for change intellectually without much disposition to pay a price personally to make it work? Is he an effective administrator, or does his ability lie in other directions?

5) Will he enforce organization discipline? Does he have the ability to communicate concepts and ideas?

6) Is he skillful at guiding subordinates?

7) Does he have the loyalty and confidence of the organization?

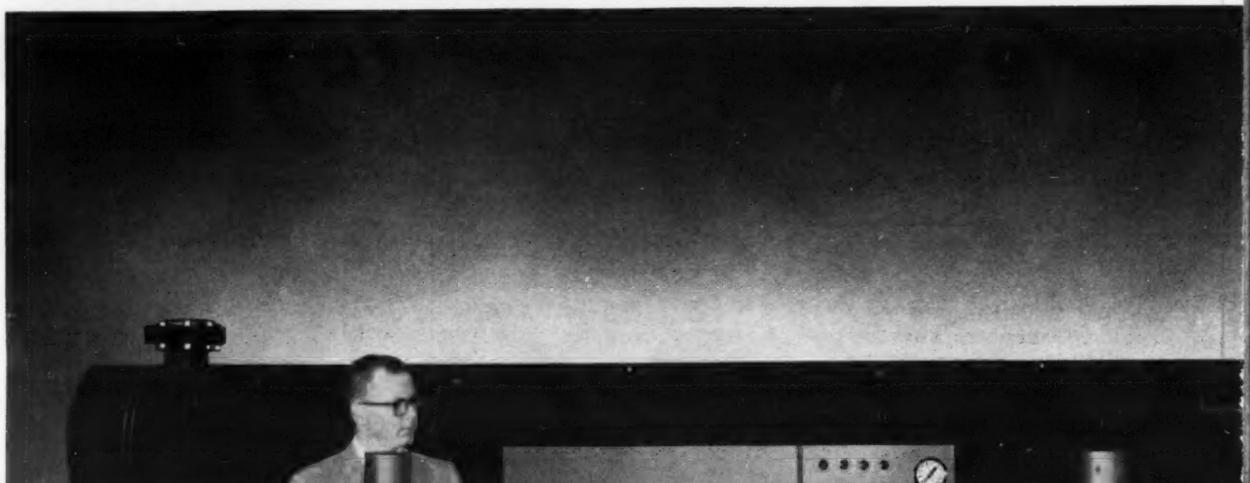
8) If he lacks the skills and interest to do certain parts of this job himself, is he willing to delegate these and back up the executives to whom they are assigned?

9) Is a suitable executive available?

Equally important, the planners must get the commitment of the chief to do the things needed to get the plan successfully launched. If he has to make speeches to management or administrate strong interest in support of training programs, or handle staff meetings in certain ways, or apply disciplinary measures to those who fail to cooperate, these things should be spelled out and his commitment obtained in advance.

If this strong support is not obtained, people down the line

Acme ... the **practical** approach to air



Both have the same capacity of 60 tons. See the difference in size between the old and new.

will say, "If he isn't interested, why should we be?"

It is also important to take into account the capacities and limitations of other key personnel and the impact of the change on them. It is important to ask:

1) What kind of ability, skills, and judgment are required that the old plan did not require?

2) How difficult will this be to acquire?

3) Do present executives have the intelligence, breadth, attitude, maturity, to develop them quickly enough? If not, can additional personnel be obtained?

4) How serious would the consequences of poor performance or failure be?

5) Can these be guarded against?

6) Can the transition from the old to the new plan be so phased as to minimize the risks of breakdown?

The planners must also consider how the proposed changes will affect the present status, prestige, and career ambitions of key executives. Will it expose poor performance they have been successfully camouflaging?

Are there rivalry, cliques, and power politics in the management group? How will these be affected? Is the new approach adopted to the way key members of the management group operate best? Sometimes the plan must be modified to deal with the human factor.

A sales manager who is weak is planning and control may be reinforced by a strong product manager.

Timing: A frequent remark when a change is suggested is, "You can't act now because we are too busy—or, you can't act now because business is too slow—we need sales—or, you can't act now because vacation is coming up—or, you can't act now because we don't have enough men.

### Everything Doesn't Have To Be Done At Once

**To all the above I say, "Poppycock." There is no time like the present to reorganize with growth in mind.**

When setting up a time-table for change, the company should recognize that everything does not have to be done at once. It can establish a long term objective and then phase its changes, depending upon the availability of qualified personnel, and other considerations.

I would like to go over with you our own organization, good or bad as it may be, the duties of the executives, and tell you that this is an organization that is doing now, in the exact same business that you are engaged in, 40 times as much business as it did 12 years ago, and we are dreaming and planning and *organizing* for growth.

Milton I. Schwartz, president: Direct operation of division. Available for closing of sales. Final check on invoices and accounts payable. Sell certain accounts. Also available to discuss the unusual intricacies of any job a salesman wants to see me about.

Robert Mindlin: Refrigeration dispatching. Approve production sheets. Lead source relations. Inventory control of used cases. Order photographs when and where necessary. Assignment of leads. In charge of advertising and publicity.

Sidney Machtiger, treasurer: Office manager. Discount and recall of notes. Collections. Accounts receivable and notes receivable. Office purchasing. Checking of all bills prepared for payment. Insurance reports. Freight claims. Order Friedrich equipment and control same. Keep salesmen's accounts and render quarterly statements. Post general ledger. Check schedules to control accounts. Also in charge of monthly accounts receivable aging, and has meetings with various salesmen to see to it that our accounts receivable do not get too old, thereby rotting and becoming uncollectable.

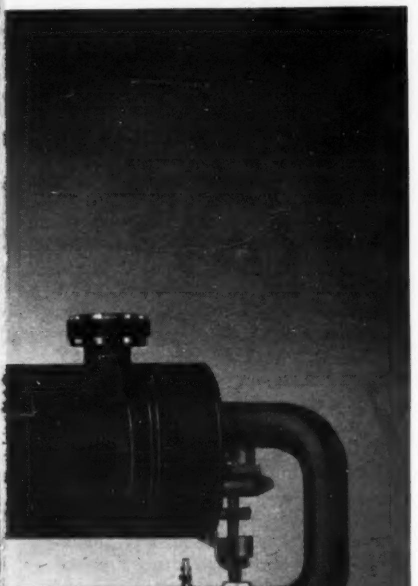
Harry Colter, executive vice president: Sell certain accounts. Labor relations on outside installations. Supervise some outside installations. Negotiate with and supervise subcontractors. Liaison between Mark Golding, Robert Mindlin, and customer. Purchasing refrigeration and air conditioning supplies and parts. Responsible for entire refrigeration department. Help salesmen sell certain accounts. Check actual contracts and see that customers get what they pay for and see that we get paid for what the customers get.

Mark Golding, vice president: Inside foreman of all mechanics other than refrigeration. Director of purchasing of all materials other than office supplies and refrigeration. Expedite production sheets. Sees to it that the production schedules are adhered to. Occasionally goes out on jobs with salesmen when a special fixture or item comes up that is difficult or impossible to draw. Hiring, firing, and supervising mechanics other than refrigeration department. Control payroll time of the people he hires. Discuss special fixtures with customers when they come in. Designs fixtures. Prepares templets. Has initial job conferences with salesmen on the jobs they sell where he goes over the production sheet, the production schedule, the outside job survey, the special fixture drawings. Also in overall charge of the trucking and delivery operation.

Stanley Hodges: Foreman of all drivers. Head of shipping and warehousing. Report directly to Mark Golding. Truck and fork-lift maintenance.

This is a company made up of men who rarely overlap. They compliment each other as a team. They're successful. They're organized for growth.

conditioning



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☆ Lighter–easier to install

☆ Lower cost–save money

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☆ Famous Acme quality–built to last

For details on this great new line of Acme Water Chillers and how they can help you, call your nearby Acme Sales Engineer or write directly to the factory.

✓ See this spectacular new Acme chiller and many other new Acme products at *Booth 508*, 14th International Heating and Air Conditioning Exposition, Convention Hall, Philadelphia, January 26-29.

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JACKSON, MICHIGAN

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Specially formulated for *safe, low-cost* cleaning of cooling water systems. When economy and safety are prime considerations, get Calgon Economy Powdered Acid from your Refrigeration Wholesaler.

CALGON COMPANY

DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.

HAGAN BUILDING, PITTSBURGH 30, PA.

In Canada: Hagan Corporation (Canada) Limited, Toronto

*254,000 Sq. Ft. of Space*

# 11-Story Livestock Exchange Building To Be Completely Cooled by Package Units

PLANS for the final installation brings smiles to Charles B. Dull (left), Union Stockyards' chief engineer, and Sidles' engineers, Randolph J. Scott, and Robert Hurstad.

ELEVATOR SHAFTS on intermediate floors of Omaha's Livestock Exchange building house two 15-hp. Airtemp packaged units on each floor. Plug-in bus duct carries 440-volt power for sole use of air conditioning equipment.

OMAHA, Neb. — Workmen now are finishing a three-stage project here that involves what is said to be one of the nation's most unusual package unit air conditioning installations.

It's the 11-story Livestock Exchange building, heart of Omaha's half-billion-dollar-a-year livestock market.

It's unusual because the Exchange's 254,000 sq. ft. of space make this one of the largest buildings ever to be completely air conditioned entirely by packaged units and because the project was "tested" for operating efficiency before completion, according to the Sidles Co. here.

Built in 1926, the building had accumulated some 67 tons of water-cooled room and window units when Sidles was contacted in 1957 and asked to develop and install a unified plan.

At the request of the building owner, Union Stockyards Co. of Omaha, Ltd., the plan called for three construction stages—one-third to be finished by early 1958 for testing purposes, another third to be completed this past summer if the test was successful, and the remainder to be started this fall.

"Sidles' designers considered the use of a central water chiller installation with individual blower coil units in each room or with central blower units ducted to each room, but this was discarded in favor of the more flexible package installation," it was pointed out.

"Factors in the choice were use of the existing units, original cost of the system, ability to install by stages, adaptability to the limited space available, chance for zonal control, five-year warranty, and lower maintenance costs."

Total new tonnage installed to date is 195 tons. This consists of 13 15-ton packages. No rental space was used for the installation. All units were installed in a vacant, 7-ft. sq. elevator shaft, and three 100-ton Marley cooling towers are located on the elevator penthouse roof. Two 25-hp. Fairbanks-Morse pumps (one for standby operation) are located in a penthouse directly beneath the towers.

### Building Is 'H' Shaped

"The building is laid out in the shape of an "H," one wing being on the south and one wing on the north with the connecting hallway containing the elevator shafts.

Sidles installed two new packaged units on each floor, one for each wing. The installation of new equipment was limited mainly to the intermediate floors. These consist of small offices which did not have air conditioning already except for three or four isolated cases where 3 or 5-ton units were handling individual office suites. These units, which totaled 23 tons, were removed when the new system was installed.

An additional 44 tons of existing cooling was left as is and connected to the new tower system. Other cooling equipment in the building was already on either evaporative condensers or on towers and required no modification whatsoever.

Air distribution systems are similar on all floors where new units are being installed. Some modifications are required to allow for different office sizes and shapes. Trunk supply lines are run along the hall ceilings and the return air is through the hallways, free return.

### Using Elevator Shafts Simplifies Piping

"Using the elevator shaft made the piping work much easier and led to another unusual installation feature," the Sidles report said.

"A plug-in bus-duct carrying 440 volts of power was built right into the shaft to supply power for the units and the cooling towers.

"This system is completely separate from the building's regular electrical distribution system and should trouble develop in the old system it will

*(Concluded on next page)*

*Serving the leaders*

*with* PRODUCT WARRANTY INSURANCE

**Coverages in the Air Conditioning and Refrigeration field**

**1 Food spoilage warranty—since 1946**

Home freezer manufacturers and private brand distributors are insured for obligations assumed under a warranty form developed by Marsh & McLennan. Prompt, direct claim service.

**2 Compressor warranty—since 1949**

Qualified OEM accounts may insure the obligations assumed by reason of extension to five years of the manufacturer's warranty on compressors, condensing units and/or refrigeration systems.

**3 Bulk farm milk tank warranty—since 1955**

Manufacturers may extend through insured plans their one-year warranty to ten years on stainless steel tanks.

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Only nationally recognized and highly rated insurance companies selected as your insurers

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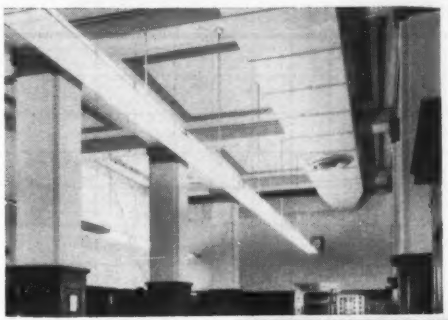
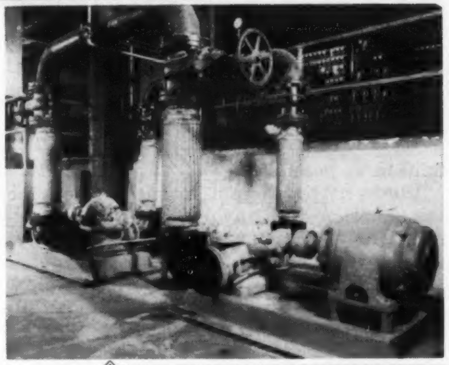
*Atlanta New Orleans Tulsa Milwaukee Phoenix Cleveland Norfolk Charleston*
*Oakland Montreal Toronto Vancouver Calgary Havana Caracas London*



INTERIOR of one of the two banks located in the building shows how ductwork was handled in large room areas.



TWIN 25-hp. pumps are located in a penthouse beneath the cooling towers. One is used for normal operation, the other is for emergency.

*(Concluded from preceding page)*

not disrupt the air conditioning service.

"Does the unified system pay? Well, look at these actual operation figures for the five-month test period on just the first one-third installation.

"Compared with operating costs for the old individual units, the building owners saved $1,794 in water costs alone. They would also have been subjected to $36 per ton per year surcharge on 67 tons of cooling which was not on towers before but are now. That saved an additional $2,412, or a total of $4,206 for the five months. They now have the additional economy of zone control on each floor."

### Part of 'A City 'Within a City'

The Exchange building is actually a part of "a city within a city." Founded as a corporation 75 years ago, Union Stockyards Co., with assets of $15,000,000, now operates what is billed as the world's largest livestock market.

Within its 212-acre domain, the company, headed by President Harry B. Coffee, is more than just a landowner. It owns and maintains all the physical facilities of the market.

Engineering, construction, and maintenance of all buildings, streets, livestock pens (5,500 for cattle and hogs alone), railroad trackage, and other facilities are handled by the company's Engineering Dept. under the direction of Charles B. Dull, chief engineer. The maintenance force numbers some 90 men.

The Exchange building itself, managed by Jules Slunicko, is nearly self-sufficient.

A visitor would expect to find offices of the Union Stockyards Co., Omaha Livestock Exchange, insurance companies, major meat packing companies, commission firms, livestock traders, and trucking firms, plus the usual babershop, bar, cigar stand, and soda fountain.

But the building also houses a radio station, a post office, a main bank and a branch bank, a restaurant and a cafeteria, a clothing store, a stationery shop, a telegraph office, offices for all railroads entering Omaha, a doctor, stock brokers, and one of the city's largest ballrooms and banquet halls.

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# Predicting Air Conditioning Sales

## *Plotting the Relationship with Residential and Commercial Construction May Help Industry Stay Current on Its Prospects*

*By J. R. O'Mahoney, Market Analyst, Air Conditioning Div., Westinghouse Electric Corp.**

For the past two air conditioning seasons, it has become apparent that the mere extension upward of past sales curves for the air conditioning market would not continue. The extension of the curves to the blue sky has led our industry astray.

The so-called "normal years curve" of 1953, 1954, 1955, and 1956 has not extended to 1957 or 1958. One unfortunate result has been the disproportionate growth of manufacturers' inventories relative to their shipments and the corresponding increase in distributor inventories (shown in Chart 1 attached).

Forecasts for the air conditioning industry need to be brought into perspective and made sensitive to changes that can reasonably be forecast. Our industry must find ways to foresee declines such as those experienced in 1957 and 1958.

One approach that deserves consideration would be to establish the total dollars that can be expected to be available in the market place for air conditioning in the years to come. If this total can then be related to indices that are predictable in the general economy, a reasonable forecast for the industry could evolve.

The proposition may be made that the total air conditioning dollar market is related to the total dollar value of public and private (non-farm) residential and non-residential construction. If this proposition can be established, the market can be

*(Continued on next page)*

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*For assistance and suggestions on this study the author acknowledges the assistance of B. A. Sienkiewicz, Air-Conditioning & Refrigeration Institute; E. F. Berg, Small Integral Motor Dept., General Electric Co.; and Arthur R. Giesen, Jr., Westinghouse Air Conditioning Div. Development of this approach to the market study was fostered by Westinghouse Air Conditioning Div. executives R. D. Hartsig and D. R. Meckstroth.

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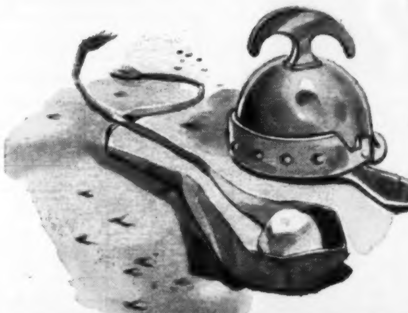
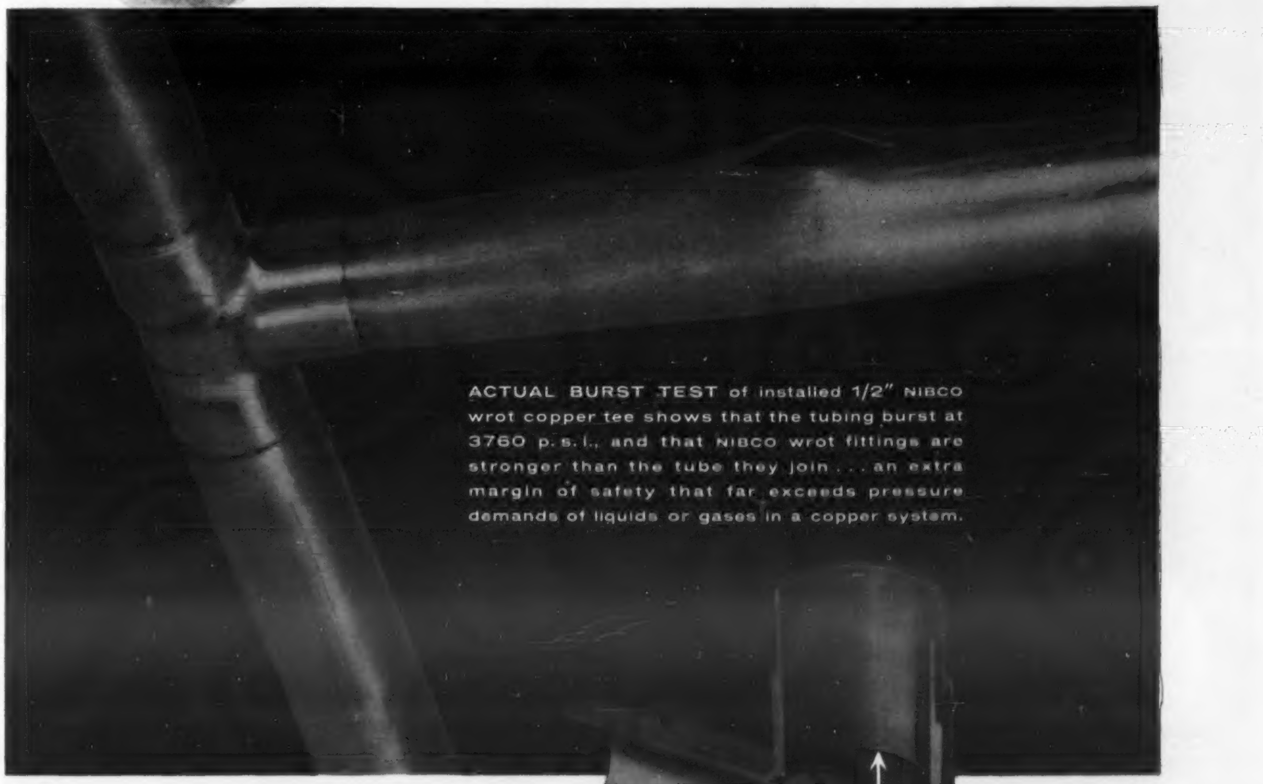


When you compare copper fittings...

**remember David and Goliath!**



ACTUAL BURST TEST of installed 1/2" NIBCO wrot copper tee shows that the tubing burst at 3760 p.s.i., and that NIBCO wrot fittings are stronger than the tube they join . . . an extra margin of safety that far exceeds pressure demands of liquids or gases in a copper system.

Like David of old, NIBCO wrot copper fittings are strong where it counts. Wall thicknesses in the NIBCO "zone of strength" (as shown in the cutaway tee, for example) are not made to the "L" minimum ASA standard, but have heavier than "K" wall thickness of metal...additionally densified in processing. This is but one reason why NIBCO fittings are specified by the nation's leading contractors and service organizations. See your NIBCO wholesaler, or send coupon for ***FREE CATALOG.***

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# Predicting--

*(Continued from preceding page)*

related to construction indices that are more readily predictable and essentially more stable than the past air conditioning market has been.

These indices have the unique advantage of covering modernization and renovation, as well as new construction. Thus, they can be assumed to relate to air conditioning as installed in new and existing structures.

Further, by keeping careful track of the level of penetration (the per cent air conditioning dollars of the total construction dollars), we can eventually determine and predict a percentage of saturation. This sort of information becomes extremely valuable to the whole field of market and facility planning.

It has been recognized that it is impossible to accurately separate components of the air conditioning market into the major categories of residential, commercial, and industrial. For most manufacturers, it is impossible to determine when a unit intended essentially for residential work will be installed commercially. Air conditioning industry figures are equally baffling, and the only agreement between industry analysts is that no agreed definition is possible.

However, to attempt to show the relationships involved, the following definitions have been used for this paper:

1. The total market includes all self-contained central equipment above 18,000 B.t.u./hr. and excludes all room units. It includes heat pumps of all sizes, year-round equipment, refrigeration chassis, all split systems (complete), all compressors above 20 hp., condensing units above 20 hp., all packaged water

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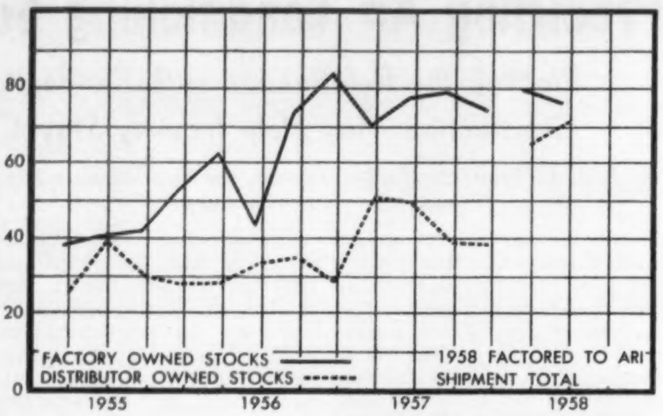
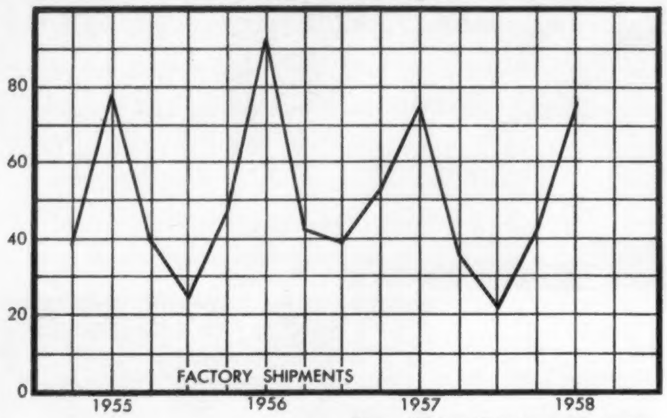
CHART 1: ARI Factory Owned, Distributor Owned Stocks



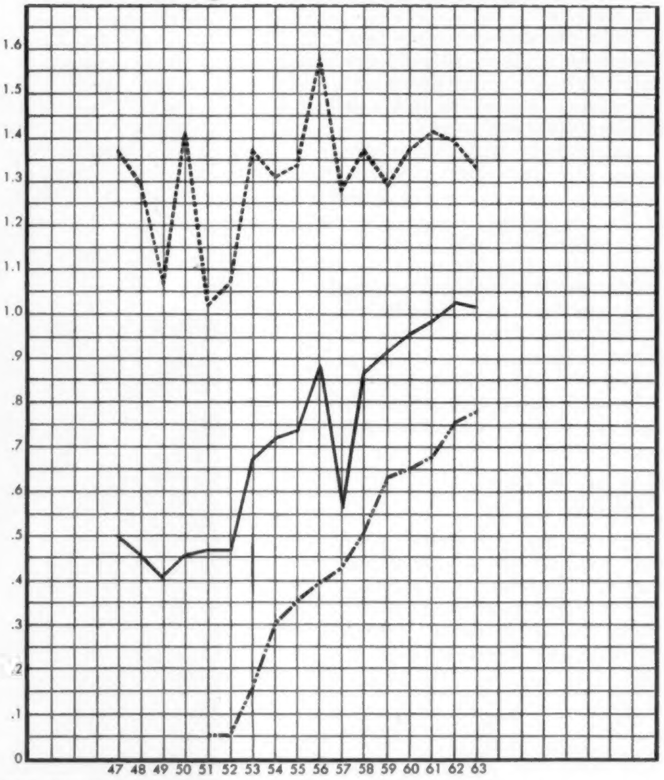
Source: ARI form S9 for appropriate quarters

CHART 1-A: ARI Shipments



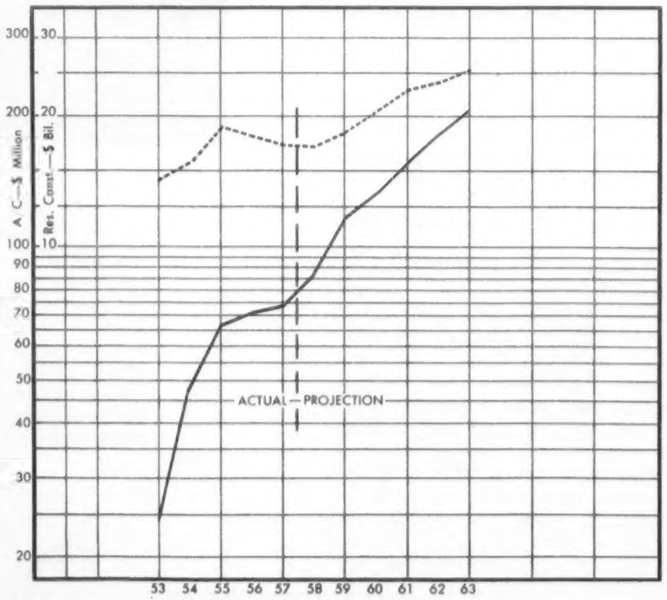
Source: ARI form S4 for appropriate quarters

CHART 4: Level of Air Conditioning Penetration—Air Conditioning Per Cent of Construction Volume

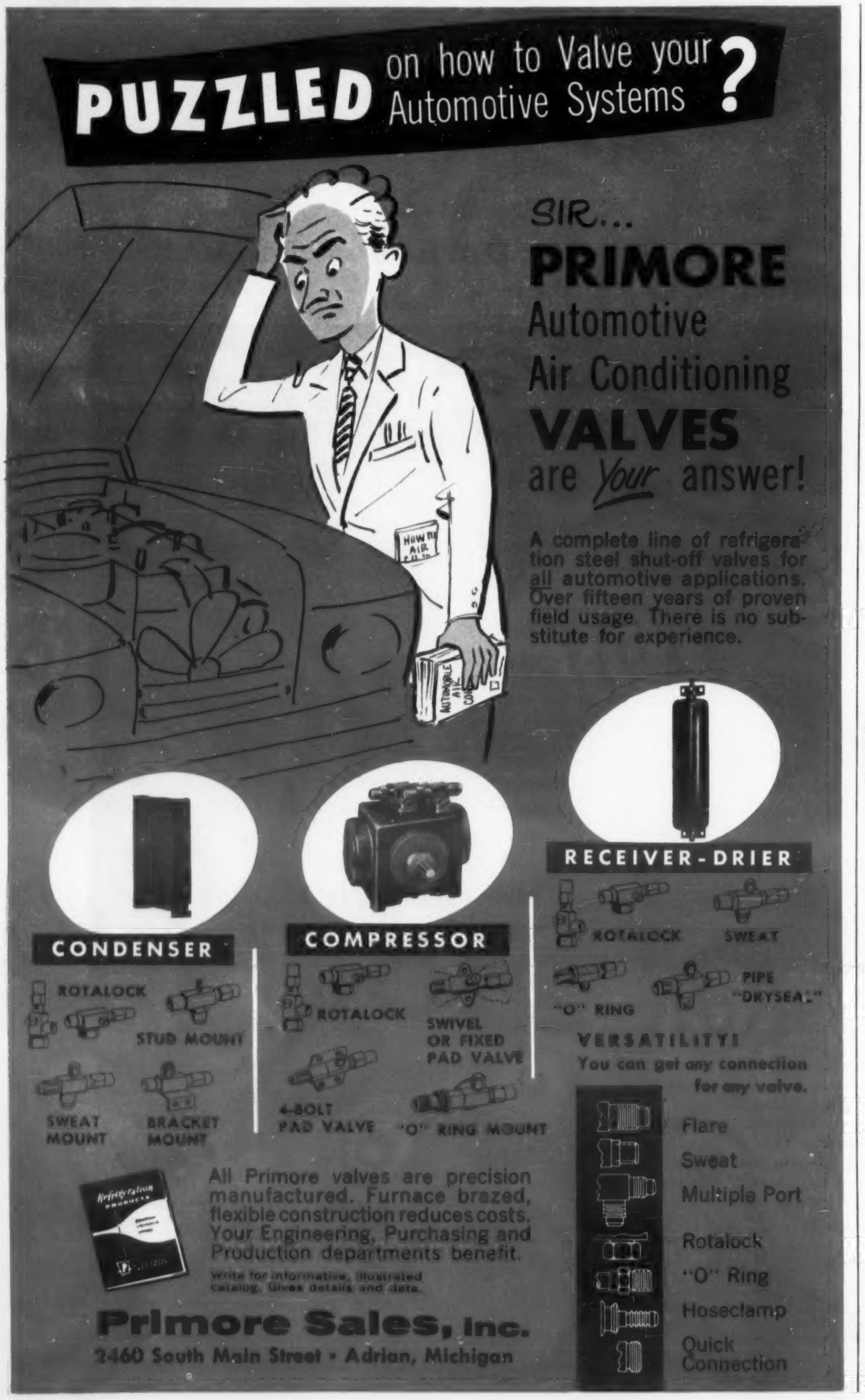


SOLID LINE: Total Air Conditioning per cent of total construction volume
DOTTED LINE: Commercial, Industrial air conditioning per cent of non-residential construction
DOT-DASH LINE: Residential air conditioning per cent of residential construction

CHART 2: Relationship of Estimated Residential Air Conditioning to Total Residential Construction



DOTTED LINE: Total Residential Construction (billions)
SOLID LINE: Residential Air Conditioning (millions)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You can get any connection for any valve.

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Write for informative, illustrated catalog. Gives details and data.

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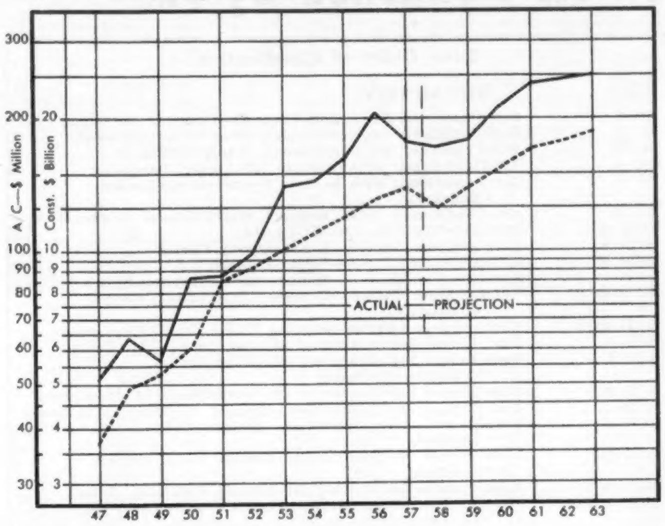
**CHART 3: Relationship of Commercial and Industrial Air Conditioning to Total Non-Residential Construction**



DOTTED LINE: Non-Residential Construction (billions)
SOLID LINE: Commercial, Industrial Air Conditioning (millions)

*(Concluded from preceding page)*

chillers, all shell-and-tube and shell-and-coil condensers, evaporative condensers, and all centrifugal systems.

2. The residential portion of this market has been defined arbitrarily as all residential self-contained units above 18,000 B.t.u./hr., all horizontal-type equipment, year-round units and refrigeration chassis, 80% heat pumps, and 70% of complete split systems.

3. The difference between this residential market and the total market has been defined as the commercial and industrial market.

Prolonged arguments could be advanced pro and con for the definitions contained.

A word of explanation about the indices; past construction figures are based upon Department of Commerce data and projections upon data from the Business Projection Committee of Westinghouse. They include public and private non-farm residential figures and public and private non-residential non-farm figures.

All figures are for new construction and modernization/renovation. Construction figures for public utilities, military facilities, highways, etc., are excluded.

The charts show that for the total market, the relationship apparently exists between air conditioning and the combined construction index.

For example, in 1949 with the decrease in construction, a fairly substantial drop occurred in air conditioning. Actually, this drop was of greater proportion than the decline in construction which was based upon contracts placed. Recollection of 1949 as a tight-money year would indicate that this is only appropriate.

In 1956 when construction did not increase at the rate generally established in preceding years, air conditioning increased at an even greater rate than in the years 1954 and 1955. It is believed that this was due to speculation toward an increase in residential air conditioning and that many of the units purchased from manufacturers remained in inventories, triggering the falldown in business for air conditioning for the years 1957 and 1958. This tends to be substantiated by Chart 1 on shipments versus inventories.

The graphs show air conditioning increasing at a rate that gives a convergent curve for the years 1960 through 1963. This means that a very conservative level of penetration to these total construction dollars has been chosen for this forecast. Chart 4 shows this to be about 1% of the total construction dollars defined above.

The relationship for decline with construction is shown on the residential curve (Chart 2) for 1956. In this case, a decline in construction resulted in an increase in residential air conditioning, but at a rate considerably less than in 1954 and 1955.

Again, note on Curve 1 how much inventories increased at the end of 1956 and 1957 relative to 1955. The relationship is less clear for the category "Other" (commercial and industrial air conditioning) and its construction index (Chart 3). Again, it must be remembered that the separation of the market into its components becomes a very difficult task.

The plot of per cent penetration for the total market indicates that a level of saturation has not been reached in 1958; but on the basis of this forecast, it may be expected around 1963 (Chart 4). Considering the per cent penetration and the construction dollars defined, the forecast is obviously on the conservative side.

The percentage relationship for residential air conditioning shows a steadily increasing curve with no saturation level yet in sight (Chart 4). The figure for other air conditioning seems to have a tendency to level at around 1.35% and appears to be stable pending the so-called breakthrough to the industrial air conditioning market (Chart 4). Should the breakthrough occur, the level might be expected to suddenly rise to a new level of stability.

Because of the relationships shown, it is believed that these crude tools can be used to establish a reasonable ceiling to the air conditioning market. Careful analysis would lead to legitimate differences concerning percentages of penetration. However, acceptance of the general proposition of a relationship to construction indices tends to channel and clarify thinking.

If, over the next few seasons, the relationship stands the test of reason, we can embark on a realistic discussion of the levels of penetration for the various segments of the market. For example, will the level of commercial/industrial penetration remain at about 1.35%, and can this be reasonably defined as saturation?

**Engineering the temperature...**
IN SINGAPORE

Twelve Recold Multizone units air condition the American International Assurance Building. These Recold Multizone units, one on each floor, supply 108,000 CFM of conditioned air for this modern, 34 zone, office building. One standard Recold air conditioning unit cools the executive penthouse.

RECOLD CORPORATION
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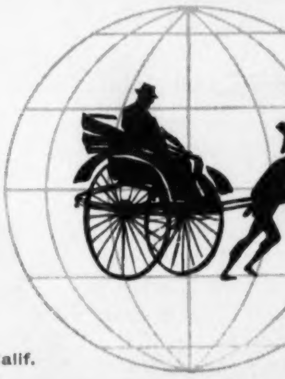
RECOLD



# Certified Unitary Air Conditioner Ratings—As Published by ARI

WASHINGTON, D. C. — Standard capacity ratings for unitary air conditioners of 20 manufacturers as published recently by Air-Conditioning & Refrigeration Institute are reproduced on these pages.

These ratings are certified to be in compliance with ARI standards 210-58, "Unitary Air Conditioning Equipment," and 250-58, "Heat Operated Unitary Air Conditioning Equipment."

The rating program, sponsored by ARI and National Warm Air Heating & Air Conditioning Association, is intended to cover all unitary equipment rated below 135,000 B.t.u.h. at standard rating conditions.

The directory in which these ratings were published explained that: "a unitary air conditioner consists of one or more factory made assemblies which normally include an evaporator or cooling coil, a compressor and condenser combination, and may include a heating function as well.

"Where such equipment is provided in more than one assembly, the separated assemblies are to be designed to be used together and the requirements of rating are based upon the use of matched assemblies.

"Unitary air conditioners, either alone or in combination with a heating plant, are to provide the functions of air circulating, air cleaning, cooling with controlled temperature, and dehumidifying, and may optionally include the function of heating and possible humidifying.

## Heat Pumps Excluded

"This program does not apply to heat pumps."

ARI pointed out that this directory is not intended to represent a complete listing of all certified models. As new companies join in the program, as additional models are certified, as presently certified models are withdrawn from the market, or as certification is withdrawn for any reason, this information will be announced in monthly supplements or in future editions of the directory.

The directory listed standard rating temperatures as follows:

| | D.B. | W.B. |
|---|---|---|
| Air temperature to cooling coil ......... | 80°F. | 67°F. |
| Air-cooled' Outside Air | 95°F. | |
| Evaporatively-cooled: Outside Air ......... | 95°F. | 75°F. |
| Water-cooled: | | |
| Water entering condenser ......... | 75°F. | |
| Water leaving condenser ......... | 95°F. | |

A detailed explanation of how the certified rating program will work was published on page 1 of the Nov. 24, 1958 issue of the NEWS.

**Basic Order of Classification**

| TYPE | DESCRIPTION |
|---|---|
| SC-A | Self-Contained Air Conditioner, Air-Cooled |
| SC-E | Self-Contained Air-Conditioner, Evaporatively-Cooled |
| SC-W | Self-Contained Air-Conditioner, Water-Cooled |
| RC-A | Air-Conditioner with Remote Air-Cooled Condenser |
| RC-E | Air-Conditioner with Remote Evaporatively-Cooled Condenser |
| RC-W | Air-Conditioner with Remote Water-Cooled Condenser |
| RCH-A | Refrigeration Chassis—Air-Cooled |
| RCH-E | Refrigeration Chassis—Evaporatively-Cooled |
| RCH-W | Refrigeration Chassis—Water-Cooled |
| RCH-RCA | Refrigeration Chassis—Remote Air-Cooled Condenser |
| RCH-RCE | Refrigeration Chassis—Remote Evaporatively-Cooled Condenser |
| RCH-RCW | Refrigeration Chassis—Remote Water Cooled Condenser |
| SCY-A | Year-Round Self-Contained Air-Conditioner, Air-Cooled |
| SCY-E | Year-Round Self-Contained Air-Conditioner, Evaporatively-Cooled |
| SCY-W | Year-Round Self-Contained Air-Conditioner, Water-Cooled |
| RCY-A | Year-Round Air-Conditioner, Remote Air-Cooled Condenser |
| RCY-E | Year-Round Air-Conditioner, Remote Evaporatively-Cooled Condenser |
| RCY-W | Year-Round Air-Conditioner, Remote Water-Cooled Condenser |
| RCU-A-C | Split System: Air-Cooled Condensing Unit, Coil Alone |
| RCU-E-C | Split System: Evaporatively-Cooled Condensing Unit, Coil Alone |
| RCU-W-C | Split System: Water-Cooled Condensing Unit, Coil Alone |
| RCU-A-CB | Split System: Air-Cooled Condensing Unit, Coil with Blower |
| RCU-E-CB | Split System: Evaporatively-Cooled Condensing Unit, Coil with Blower |
| RCU-W-CB | Split System: Water-Cooled Condensing Unit, Coil with Blower |

## Ratings

**AIRTEMP DIVISION, CHRYSLER CORPORATION**
1600 Webster Street,
Dayton 1, Ohio
Trade Name: Airtemp

| Type | Designation: Model Number | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | 1118 | | 18,000 |
| SC-A | 1102-02 | | 20,200 |
| SC-A | 1103-2 | | 33,600 |
| SC-W | 1003-4 | | 33,600 |
| SC-W | 1005-2 | | 60,000 |
| SC-W | 1008-2 | | 90,000 |
| SC-W | 1011 | | 132,000 |
| RC-A | 1005-3 | | 50,400 |
| RC-A | 1008-3 | | 79,440 |
| RC-A | 1011-2 | | 113,400 |
| | System | Condensing Unit | |
| RCU-A-CB | AT-203 | 1218 | 19,000 |
| RCU-A-CB | AT-403 | 1203-3 | 33,100 |
| RCU-A-CB | AT-405 | 1203-3 | 36,000 |
| RCU-A-CB | AT-403 | 1203-4 | 32,100 |
| RCU-A-CB | AT-405 | 1203-4 | 36,000 |
| RCU-A-CB | AT-603 | 1205-1 | 43,800 |
| RCU-A-CB | AT-605 | 1205-1 | 50,400 |
| RCU-A-CB | AT-606 | 1205-1 | 52,800 |
| RCU-A-CB | AT-608 | 1205-1 | 58,400 |
| RCU-A-CB | AT-805 | 1208 | 79,450 |
| RCU-A-CB | AT-808 | 1208 | 87,000 |
| RCU-A-CB | AT-811 | 1208 | 90,000 |
| RCU-A-CB | AT-603 | 1206-00 | 47,300 |
| RCU-A-CB | AT-605 | 1206-00 | 55,000 |
| RCU-A-CB | AT-606 | 1206-00 | 57,530 |
| RCU-A-CB | AT-608 | 1206-00 | 63,530 |
| RCU-A-CB | AT-203 | 1202-2 | 22,100 |
| RCU-A-C | AT-202 | 1218 | 17,800 |
| RCU-A-C | AT-203 | 1218 | 19,000 |
| RCU-A-C | AT-402 | 1203-3 | 27,950 |
| RCU-A-C | AT-403 | 1203-3 | 33,100 |
| RCU-A-C | AT-405 | 1203-3 | 36,000 |
| RCU-A-C | AT-402 | 1203-4 | 27,950 |
| RCU-A-C | AT-403 | 1203-4 | 33,100 |
| RCU-A-C | AT-405 | 1203-4 | 36,000 |
| RCU-A-C | AT-603 | 1205-1 | 43,800 |
| RCU-A-C | AT-605 | 1205-1 | 50,400 |
| RCU-A-C | AT-606 | 1205-1 | 52,800 |
| RCU-A-C | AT-608 | 1205-1 | 58,400 |
| RCU-A-C | AT-805 | 1208 | 79,450 |
| RCU-A-C | AT-808 | 1208 | 87,000 |
| RCU-A-C | AT-603 | 1206-00 | 47,300 |
| RCU-A-C | AT-605 | 1206-00 | 55,000 |
| RCU-A-C | AT-606 | 1206-00 | 57,530 |
| RCU-A-C | AT-608 | 1206-00 | 63,530 |
| RCU-A-C | AT-202 | 1202-2 | 20,000 |
| RCU-A-C | AT-203 | 1202-2 | 22,100 |
| | Model Number | | |
| RCU-W-CB | 1303-4 | | 38,600 |
| RCU-W-CB | 1305-2 | | 60,000 |
| RCU-W-CB | 1308-2 Coil # 1488 | | 90,000 |
| RCU-W-CB | 1308-2 Coil # 1489 | | 96,000 |
| RCU-W-CB | 1311 | | 132,000 |

**AMANA REFRIGERATION, INC.**
Amana, Iowa
Trade Name: Amana

| Type | Designation: Model Number | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | PK224-1 | | 24,000 |
| SC-A | PK336-1 | | 36,000 |
| SC-A | PK448T-1 | | 48,000 |
| SC-A | PK560T-1 | | 60,000 |
| | Condensing Unit | Cooling Coil | |
| RCU-A-C | HR224-1 | LA224 | 24,000 |
| RCU-A-C | HR224-1 | LU224 | 24,000 |
| RCU-A-C | HR336-1 | LA336 | 36,000 |
| RCU-A-C | HR336-1 | LU336 | 36,000 |
| RCU-A-C | HR448-1 | LA448 | 48,000 |
| RCU-A-C | HR448-1 | LU448 | 48,000 |
| RCU-A-C | HR560-1 | LA560 | 60,000 |
| RCU-A-C | HR560-1 | LU560 | 60,000 |
| RCU-A-CB | HR224-1 | LB224 | 24,000 |
| RCU-A-CB | HR336-1 | LB336 | 36,000 |
| RCU-A-CB | HR448-1 | LB448 | 48,000 |
| RCU-A-CB | HR560-1 | LB560 | 60,000 |

**(AMERICAN BLOWER)**
**AMERICAN-STANDARD INDUSTRIAL DIVISION**
Detroit 32, Michigan
Trade Name: CAC

| Type | Designation: Model Number | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-W | 251-3 | 3C7-1 | 36,000 |
| SC-W | 251-3 | 3C7-2 | 36,000 |
| SC-W | 251-3 | 3C7-3 | 36,000 |
| SC-W | 251-5 | 5C7-1 | 60,000 |
| SC-W | 251-5 | 5C7-2 | 60,000 |
| SC-W | 251-5 | 5C7-3 | 60,000 |
| SC-W | 251-8 | 8C7-2 | 90,000 |
| SC-W | 251-8 | 8C7-3 | 90,000 |
| SC-W | 251-10 | 10C7-2 | 120,000 |
| SC-W | 251-10 | 10C7-3 | 120,000 |
| SC-W | 251-10 | 10D7-2 | 120,000 |
| SC-W | 251-10 | 10D7-3 | 120,000 |
| RC-A | 252-5 | 5CA8-1 | 52,000 |
| RC-A | 252-5 | 5CA8-2 | 52,000 |
| RC-A | 252-5 | 5CA8-3 | 52,000 |
| RC-A | 252-8 | 8CA8-2 | 80,000 |
| RC-A | 252-8 | 8CA8-3 | 80,000 |
| RC-A | 252-10 | 10CA8-2 | 105,000 |
| RC-A | 252-10 | 10CA8-3 | 105,000 |
| RC-A | 252-10 | 10DA8-2 | 105,000 |
| RC-A | 252-10 | 10DA8-3 | 105,000 |

**AMERICAN FURNACE COMPANY**
1300 Hampton Avenue,
St. Louis 10, Missouri
Trade Name: Comfortmaker

| Type | Designation: Model Number | Standard Rating B.t.u.h. |
|---|---|---|
| SC-A | AM-2 | 21,500 |
| SC-A | AM-3 | 34,000 |
| SC-A | AM3-3 | 34,000 |
| RCU-A-C | 2A-1-EH | 22,000 |
| RCU-A-C | 2A-1-AV | 22,000 |
| RCU-A-C | 3A-1-EH | 35,000 |
| RCU-A-C | 3A-1-AV | 35,000 |
| RCU-A-C | 3A-3-EH | 34,000 |
| RCU-A-C | 3A-3-AV | 34,000 |
| RCU-A-C | 4A-EH | 47,500 |
| RCU-A-C | 4A-AV | 47,500 |
| RCU-A-C | 4A-3-EH | 47,500 |
| RCU-A-C | 4A-3-AV | 47,500 |
| RCU-A-C | 5A-EH | 62,000 |
| RCU-A-C | 5A-AV | 62,000 |
| RCU-A-C | 5A-3-EH | 62,000 |
| RCU-A-C | 5A-3-AV | 62,000 |
| RCU-A-C | 85A-EH | 84,500 |
| RCU-A-C | 85A-AV | 84,500 |
| RCU-A-C | 85A3-EH | 84,500 |
| RCU-A-C | 85A3-AV | 84,500 |
| RCU-A-C | 120A-EH | 124,000 |
| RCU-A-C | 120A-AV | 124,000 |
| RCU-A-C | 120A-3-EH | 124,000 |
| RCU-A-C | 120A-3-AV | 124,000 |

**ARKLA AIR CONDITIONING CORPORATION**
Evansville 7, Indiana
Trade Name: Sun Valley

| Type | Designation: Model Number | Standard Rating B.t.u.h. |
|---|---|---|
| G-SC-W | 500 | 42,000 |
| G-SC-W | 750 | 60,000 |
| G-SC-W | 750H | 60,000 |

**BRYANT MANUFACTURING COMPANY**
2020 Montcalm Street,
Indianapolis, Indiana
Trade Name: Bryant

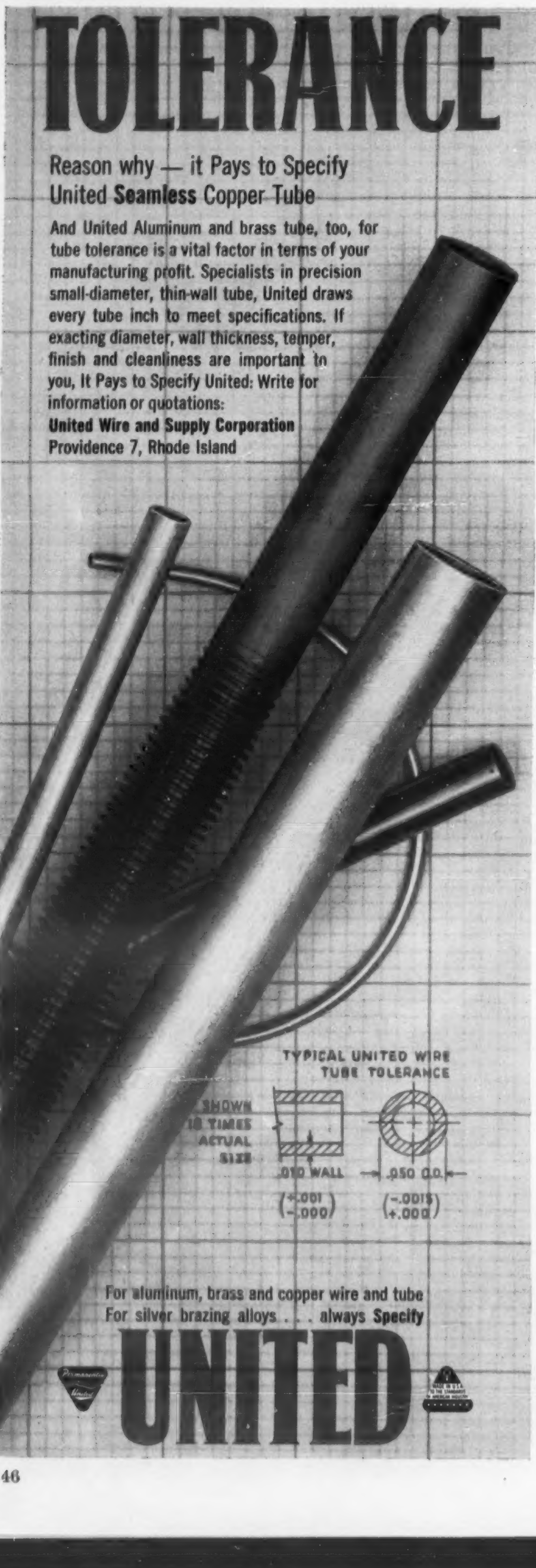
| Type | Designation: Model Number | | | Standard Rating B.t.u.h. |
|---|---|---|---|---|
| SC-A | 24-556A | | | 25,000 |
| SC-A | 30-556B | 1ϕ | | 34,000 |
| SC-A | 30-556B | 3ϕ | | 34,000 |
| RCU-A-CB | 30-560D | 1ϕ | W/30VB | 31,000 |
| RCU-A-CB | 30-560D | 3ϕ | W/30VB | 31,000 |
| RCU-A-CB | 40-560D | 1ϕ | W/40VB | 42,000 |
| RCU-A-CB | 40-560D | 3ϕ | W/40VB | 42,000 |
| RCU-A-CB | 50-560D | 1ϕ | W/50VB | 53,000 |
| RCU-A-CB | 50-560D | 3ϕ | W/50VB | 53,000 |
| RCU-A-CB | 60-560D | 3ϕ | W/60VB | 64,000 |
| RCU-A-CB | 24-562A | 1ϕ | W/20VB | 23,000 |
| RCU-A-CB | 24-562A | 1ϕ | W/30VB | 25,000 |
| RCU-A-CB | 36-562A | 1ϕ | W/40VB | 35,000 |
| RCU-A-CB | 36-562A | 3ϕ | W/40VB | 35,000 |
| RCU-A-C | 30-560D | 1ϕ | W/30H | 30,000 |
| RCU-A-C | 30-560D | 1ϕ | W/30S | 31,000 |
| RCU-A-C | 30-560D | 1ϕ | W/36-504 | 32,000 |
| RCU-A-C | 30-560D | 3ϕ | W/30H | 30,000 |
| RCU-A-C | 30-560D | 3ϕ | W/30S | 31,000 |
| RCU-A-C | 30-560D | 3ϕ | W/36-504 | 32,000 |
| RCU-A-C | 40-560D | 1ϕ | W/40A | 42,000 |
| RCU-A-C | 40-560D | 1ϕ | W/40H | 42,000 |
| RCU-A-C | 40-560D | 1ϕ | W/40S | 42,000 |
| RCU-A-C | 40-560D | 3ϕ | W/40A | 42,000 |
| RCU-A-C | 40-560D | 3ϕ | W/40H | 42,000 |
| RCU-A-C | 40-560D | 3ϕ | W/40S | 42,000 |
| RCU-A-C | 50-560D | 1ϕ | W/50A | 53,000 |
| RCU-A-C | 50-560D | 1ϕ | W/50S | 53,000 |
| RCU-A-C | 50-560D | 1ϕ | W/48-504 | 53,000 |
| RCU-A-C | 50-560D | 3ϕ | W/50A | 53,000 |
| RCU-A-C | 50-560D | 3ϕ | W/50S | 53,000 |
| RCU-A-C | 50-560D | 3ϕ | W/48-504 | 53,000 |
| RCU-A-C | 60-560D | 3ϕ | W/60V | 63,000 |
| RCU-A-C | 60-560D | 3ϕ | W/60-504 | 65,000 |
| RCU-A-C | 24-562A | 1ϕ | W/20A | 22,000 |
| RCU-A-C | 24-562A | 1ϕ | W/20H | 23,000 |
| RCU-A-C | 24-562A | 1ϕ | W/20S | 23,000 |
| RCU-A-C | 24-562A | 1ϕ | W/30A | 25,000 |
| RCU-A-C | 24-562A | 1ϕ | W/30H | 25,000 |
| RCU-A-C | 24-562A | 1ϕ | W/30S | 25,000 |
| RCU-A-C | 24-562A | 1ϕ | W/24-504 | 24,000 |
| RCU-A-C | 36-562A | 1ϕ | W/40A | 35,000 |
| RCU-A-C | 36-562A | 1ϕ | W/40H | 35,000 |
| RCU-A-C | 36-562A | 1ϕ | W/40S | 35,000 |
| RCU-A-C | 36-562A | 3ϕ | W/40A | 35,000 |
| RCU-A-C | 36-562A | 3ϕ | W/40H | 35,000 |
| RCU-A-C | 36-562A | 3ϕ | W/40S | 35,000 |
| RCU-A-C | 36-562A | 1ϕ | W/36-504 | 36,000 |
| RCU-A-C | 36-562A | 3ϕ | W/36-504 | 36,000 |
| RCU-A-C | 48-562A | 1ϕ | W/48-504 | 46,000 |
| RCU-A-C | 48-562A | 3ϕ | W/48-504 | 46,000 |

**CARRIER CORPORATION**
Carrier Parkway,
Syracuse 1, N. Y.
Trade Name: Weathermaker

| Type | Designation: Model Number | Standard Rating B.t.u.h. |
|---|---|---|
| SC-A | 63D2 | 23,000 |
| SC-A | 63D7 | 30,000 |
| SC-W | 50R4 | 39,000 |
| SC-W | 50R6 | 62,000 |
| SC-W | 50K8 | 92,000 |
| SC-W | 50K12 (6D68) | 126,000 |
| SC-W | 50K12 (2-6D45) | 128,000 |
| RCU-A-CB | 38D1A-38F2 | 22,000 |
| RCU-A-CB | 38D1A-38F4 | 24,000 |
| RCU-A-CB | 38D2A-38F2 | 27,000 |
| RCU-A-CB | 38D2A-38F4 | 30,000 |
| RCU-A-CB | 38E3-38F2 | 29,000 |
| RCU-A-CB | 38E3-38F4 | 32,000 |
| RCU-A-CB | 38D4A-38F4 | 40,000 |
| RCU-A-CB | 38D4A-38F6 | 43,000 |
| RCU-A-CB | 38D6A-38F6 | 50,000 |
| RCU-A-CB | 38D6A-38F11 | 57,000 |
| RCU-A-CB | 38D11A-38F6 | 58,000 |
| RCU-A-CB | 38D11-38F11 | 66,000 |
| RCU-A-CB | 38E8-38R8 | 90,000 |
| RCU-A-CB | 38E8-38R12 | 97,000 |
| RCU-A-CB | 38E12-38R12 | 120,000 |
| RCU-A-C | 38D1A-38L24V | 23,000 |
| RCU-A-C | 38D1A-38L30V | 24,000 |
| RCU-A-C | 38D1A-38D2 | 23,000 |
| RCU-A-C | 38D1A-38L2H | 23,000 |
| RCU-A-C | 38D1A-38L2V-308 | 23,000 |
| RCU-A-C | 38D1A-38L2V-318 | 23,000 |
| RCU-A-C | 38D1A-38D4 | 24,000 |
| RCU-A-C | 38D1A-38L4H | 25,000 |
| RCU-A-C | 38D1A-38L4V | 25,000 |
| RCU-A-C | 38D2A-38L24V | 28,000 |
| RCU-A-C | 38D2A-38L30V | 30,000 |
| RCU-A-C | 38D2A-38L36V | 31,000 |
| RCU-A-C | 38D2A-38D2 | 27,000 |
| RCU-A-C | 38D2A-38L2H | 29,000 |
| RCU-A-C | 38D2A-38L2V-318 | 27,000 |
| RCU-A-C | 38D2A-38L2V-308 | 27,000 |
| RCU-A-C | 38D2A-38D4 | 30,000 |
| RCU-A-C | 38D2A-38L4H | 30,000 |
| RCU-A-C | 38D2A-38L4V | 32,000 |
| RCU-A-C | 38E3-38L24V | 28,000 |
| RCU-A-C | 38E3-38L30V | 32,000 |
| RCU-A-C | 38E3-38L36V | 33,000 |
| RCU-A-C | 38E3-38L48V | 33,000 |
| RCU-A-C | 38E3-38D2 | 30,000 |
| RCU-A-C | 38E3-38L2H | 29,000 |
| RCU-A-C | 38E3-38L2V-318 | 28,000 |
| RCU-A-C | 38E3-38L2V-308 | 28,000 |
| RCU-A-C | 38E3-38D4 | 31,000 |
| RCU-A-C | 38E3-38L4H | 32,000 |
| RCU-A-C | 38E3-38L4V | 32,000 |
| RCU-A-C | 38D4A-38D4 | 39,000 |
| RCU-A-C | 38D4A-38L4H | 41,000 |
| RCU-A-C | 38D4A-38L4V | 41,000 |
| RCU-A-C | 38D4A-38D6 | 43,000 |
| RCU-A-C | 38D4A-38L6H | 43,000 |
| RCU-A-C | 38D4A-38L6V-318 | 43,000 |
| RCU-A-C | 38D4A-38L6V-308 | 43,000 |
| RCU-A-C | 38D4A-38L30V | 41,000 |
| RCU-A-C | 38D4A-38L36V | 43,000 |
| RCU-A-C | 38D4A-38L48V | 45,000 |
| RCU-A-C | 38D4A-38L60V | 47,000 |
| RCU-A-C | 38D6A-38L36V | 49,000 |
| RCU-A-C | 38D6A-38L48V | 52,000 |
| RCU-A-C | 38D6A-38L60V | 54,000 |
| RCU-A-C | 38D6A-38D6 | 50,000 |
| RCU-A-C | 38D6A-38L6H | 51,000 |
| RCU-A-C | 38D6A-38L6V-318 | 51,000 |
| RCU-A-C | 38D6A-38L6V-308 | 50,000 |
| RCU-A-C | 38D11A-38L60V | 63,000 |
| RCU-A-C | 38D11A-38D6 | 58,000 |
| RCU-A-C | 38D11A-38L6H | 58,000 |
| RCU-A-C | 38D11-38L6V-318 | 60,000 |
| RCU-A-C | 38D11-38L6V-308 | 58,000 |

**GENERAL ELECTRIC COMPANY**
Troup Highway,
Tyler, Texas
Trade Name: General Electric

| Type | Designation | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | 21TC24B | | 24,000 |
| SC-A | 21TC30B | | 30,000 |
| SC-A | 21TC36B | | 36,000 |
| | Condensing Unit | Cooling Coil | |
| RCU-A-C | 21TA25B | 21TXA200C | 23,000 |
| RCU-A-C | 21TA25B | 21TXF200A | 23,000 |
| RCU-A-C | 21TA33B | 21TXA250C | 29,200 |
| RCU-A-C | 21TA33B | 21TXF250A | 29,200 |
| RCU-A-C | 21TA40A | 21TXA300C | 36,200 |
| RCU-A-C | 21TA40B | 21TXA300C | 36,200 |
| RCU-A-C | 21TA40A | 21TXF300A | 36,200 |
| RCU-A-C | 21TA40B | 21TXF300A | 36,200 |
| RCU-A-C | 21TA53A | 21TXA400C | 48,900 |
| RCU-A-C | 21TA53A | 21TXF400A | 48,900 |
| RCU-A-C | 21TA63A | 21TXA500C | 57,600 |
| RCU-A-C | 21TA63A | 21TXF500A | 57,600 |


TOLERANCE
Reason why — it Pays to Specify United Seamless Copper Tube
And United Aluminum and brass tube, too, for tube tolerance is a vital factor in terms of your manufacturing profit. Specialists in precision small-diameter, thin-wall tube, United draws every tube inch to meet specifications. If exacting diameter, wall thickness, temper, finish and cleanliness are important to you, It Pays to Specify United: Write for information or quotations:
United Wire and Supply Corporation
Providence 7, Rhode Island
TYPICAL UNITED WIRE TUBE TOLERANCE
SHOWN 18 TIMES ACTUAL SIZE
.010 WALL
(+.001 -.000)
.050 O.D.
(-.0015 +.000)
For aluminum, brass and copper wire and tube
For silver brazing alloys . . . always Specify
UNITED

*Thinking of —*

- changing territories
- expanding your territory
- taking on new lines—

Check the
CLASSIFIED ADS

*Your opportunity may be there.*

## Certified Unitary Air Conditioner Ratings--

**GIBSON REFRIGERATOR COMPANY**
**DIVISION OF HUPP CORPORATION**
515 W. Williams Street,
Greenville, Michigan
**Trade Name: Gibson**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | GO 21A | | 24,000 |
| SC-A | GO 30 | | 36,000 |
| SC-A | GO 50A | | 60,000 |
| SC-A | 3GO 50A | | 60,000 |
| RCU-A-C | 1GAR31 | | 35,000 |
| RCU-A-C | 1GAR51 | | 57,000 |
| RCU-A-C | 3GAR31 | | 35,000 |
| RCU-A-C | 3GAR51 | | 57,000 |

**HALL-NEAL FURNACE COMPANY**
1324 North Capitol Ave.,
Indianapolis 7, Indiana
**Trade Name: Victoraire**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | 175AH | | 19,250 |
| SC-A | 201OH | | 19,250 |
| SC-A | 301AH | | 34,000 |
| SC-A | 301OH | | 34,000 |
| SC-A | 303AH | | 34,000 |
| SC-A | 303OH | | 34,000 |
| SC-W | 201VW | | 24,760 |
| SC-W | 203VW | | 24,760 |
| SC-W | 301VW | | 38,650 |
| SC-W | 303VW | | 38,650 |
| SC-W | 501VW | | 65,800 |
| SC-W | 503VW | | 65,800 |
| RCU-A-C | 201RPR | | 22,500 |
| RCU-A-C | 203RPR | | 22,500 |
| RCU-A-C | 301RPR | | 35,300 |
| RCU-A-C | 303RPR | | 35,300 |
| RCU-A-C | 501RPR | | 59,100 |
| RCU-A-C | 503RPR | | 59,100 |

**LENNOX INDUSTRIES, INCORPORATED**
200 South 12th Avenue,
Marshalltown, Iowa
**Trade Name: Lennox**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | CHA4-201 | | 22,000 |
| SC-A | CHA4-301 | | 36,000 |
| SC-W | CB11-301 | | 36,000 |
| SC-W | CU11-301 | | 36,000 |
| SC-W | CB11-303 | | 36,000 |
| SC-W | CU11-303 | | 36,000 |
| SC-W | CB11-501 | | 60,000 |
| SC-W | CU11-501 | | 60,000 |
| SC-W | CB11-503 | | 60,000 |
| SC-W | CU11-503 | | 60,000 |
| RCU-A-CB | HSA3-301-2 | LSBH5-300 | 36,000 |
| RCU-A-CB | HSA3-301-2 | C261-300 | 37,000 |
| RCU-A-CB | HSA3-301-2 | LSBH5-500 | 40,000 |
| RCU-A-CB | HSA3-301-3 | LSBH5-300 | 36,000 |
| RCU-A-CB | HSA3-301-3 | C261-300 | 37,000 |
| RCU-A-CB | HSA3-301-3 | LSBH5-500 | 40,000 |
| RCU-A-CB | HSA3-303-2 | LSBH5-300 | 36,000 |
| RCU-A-CB | HSA3-303-2 | C261-300 | 37,000 |
| RCU-A-CB | HSA3-303-2 | LSBH5-500 | 40,000 |
| RCU-A-CB | HSA3-303-3 | LSBH5-300 | 36,000 |
| RCU-A-CB | HSA3-303-3 | C261-300 | 37,000 |
| RCU-A-CB | HSA3-303-3 | LSBH5-500 | 40,000 |
| RCU-A-CB | HSA3-403-4 | LSBH5-300 | 46,000 |
| RCU-A-CB | HSA3-401-3 | C261-300 | 47,000 |
| RCU-A-CB | HSA3-401-3 | LSBH5-500 | 49,000 |
| RCU-A-CB | HSA3-403-3 | LSBH5-300 | 46,000 |
| RCU-A-CB | HSA3-403-3 | C261-300 | 47,000 |
| RCU-A-CB | HSA3-403-3 | LSBH5-500 | 49,000 |
| RCU-A-CB | HSA3-401-4 | LSBH5-300 | 46,000 |
| RCU-A-CB | HSA3-401-4 | C261-300 | 47,000 |
| RCU-A-CB | HSA3-403-3 | LSBH5-500 | 49,000 |
| RCU-A-CB | HSA3-403-4 | LSBH5-300 | 46,000 |
| RCU-A-CB | HSA3-403-4 | C261-300 | 47,000 |
| RCU-A-CB | HSA3-403-4 | LSBH5-500 | 49,000 |
| RCU-A-CB | HSA3-501-2 | LSBH5-500 | 59,000 |
| RCU-A-CB | HSA3-501-2 | LSBH5-750 | 64,000 |
| RCU-A-CB | HSA3-503-2 | LSBH5-500 | 59,000 |
| RCU-A-CB | HSA3-503-2 | LSBH5-750 | 64,000 |
| RCU-A-CB | HSA3-501-3 | LSBH5-500 | 59,000 |
| RCU-A-CB | HSA3-501-3 | LSBH5-750 | 64,000 |
| RCU-A-CB | HSA3-503-3 | LSBH5-500 | 59,000 |
| RCU-A-CB | HSA3-503-3 | LSBH5-750 | 64,000 |
| RCU-A-CB | HSA2-201-3 | LS2-200-300 | 22,000 |
| RCU-A-CB | HSA2-201-3 | C261-300 | 24,000 |
| RCU-A-CB | HSA2-753-2 | LSBH5-750 | 85,000 |
| RCU-A-CB | HSA2-753-2 | LSBH5-1000 | 88,000 |
| RCU-A-CB | HSA2-1003-2 | LSBH5-1000 | 114,000 |
| RCU-A-CB | HSA2-201-3 | LSBH5-300 | 23,000 |

**NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.**

**MUELLER CLIMATROL**
**DIVISION OF WORTHINGTON CORPORATION**
2005 West Oklahoma Avenue,
Milwaukee 1, Wisconsin
**Trade Name: Mueller Climatrol**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | 915-1-21 | | 22,000 |
| SC-A | 915-1-31 | | 32,000 |
| SC-A | 915-1-41 | | 42,000 |
| RCU-A-CB | 908-1-51 | 917-500 | 50,000 |
| RCU-A-CB | 908-1-53 | 917-500 | 50,000 |
| RCU-A-CB | 908-1-73 | 917-750 | 80,000 |
| RCU-A-CB | 918-21 | 917-200 | 22,000 |
| RCU-A-CB | 918-1-31 | 917-300 | 34,000 |
| RCU-A-CB | 918-1-33 | 917-300 | 34,000 |
| RCU-A-CB | 918-41 | 917-400 | 45,000 |
| RCU-A-CB | 918-43 | 917-400 | 45,000 |
| RCU-A-CB | 918-51 | 917-500 | 56,000 |
| RCU-A-CB | 918-53 | 917-500 | 56,000 |
| RCU-A-C | 908-1-51 | 919-5 | 50,000 |
| RCU-A-C | 908-1-51 | 922-5 | 50,000 |
| RCU-A-C | 908-1-51 | 900-500 | 50,000 |
| RCU-A-C | 908-1-53 | 919-5 | 50,000 |
| RCU-A-C | 908-1-53 | 922-5 | 50,000 |
| RCU-A-C | 908-1-53 | 900-500 | 50,000 |
| RCU-A-C | 908-1-73 | 919-7 | 80,000 |
| RCU-A-C | 908-1-73 | 900-750 | 80,000 |
| RCU-A-C | 918-21 | 919-2 | 22,000 |
| RCU-A-C | 918-21 | 922-2 | 22,000 |
| RCU-A-C | 918-21 | 900-200 | 22,000 |
| RCU-A-C | 918-1-31 | 919-3 | 34,000 |
| RCU-A-C | 918-1-31 | 922-3 | 34,000 |
| RCU-A-C | 918-1-31 | 900-300 | 34,000 |
| RCU-A-C | 918-1-33 | 919-3 | 34,000 |
| RCU-A-C | 918-1-33 | 922-3 | 34,000 |
| RCU-A-C | 918-1-33 | 900-300 | 34,000 |
| RCU-A-C | 918-41 | 919-4 | 45,000 |
| RCU-A-C | 918-41 | 922-4 | 45,000 |
| RCU-A-C | 918-41 | 900-400 | 45,000 |
| RCU-A-C | 918-43 | 919-4 | 45,000 |
| RCU-A-C | 918-43 | 922-4 | 45,000 |
| RCU-A-C | 918-43 | 900-400 | 45,000 |
| RCU-A-C | 918-51 | 919-5 | 56,000 |
| RCU-A-C | 918-51 | 922-5 | 56,000 |
| RCU-A-C | 918-51 | 900-500 | 56,000 |
| RCU-A-C | 918-53 | 919-5 | 56,000 |
| RCU-A-C | 918-53 | 922-5 | 56,000 |
| RCU-A-C | 918-53 | 900-500 | 56,000 |

**NATIONAL-U. S. RADIATOR CORPORATION**
221 Central Avenue,
Johnstown, Pa.
**Trade Name: Capitolaire**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | COM-1A-083 | | 83,500 |
| SC-A | COM-1A-103 | | 110,500 |
| SC-W | COM-1W-083 | | 89,384 |
| SC-W | COM-1W-103 | | 116,802 |
| | Condensing Unit | Coil Unit | |
| RCU-A-CB | RES-2AR-021 | FB-2 | 21,858 |
| RCU-A-CB | RES-2AR-031 | FB-3 | 31,621 |
| RCU-A-CB | RES-2AR-033 | FB-3 | 31,621 |
| RCU-A-CB | RES-2AR-051 | FB-5 | 53,283 |
| RCU-A-CB | RES-2AR-053 | FB-5 | 53,283 |
| RCU-A-C | RES-2AR-021 | F-2 | 21,858 |
| RCU-A-C | RES-2AR-031 | F-3 | 31,621 |
| RCU-A-C | RES-2AR-033 | F-3 | 31,621 |

**PEERLESS CORPORATION**
1853 Ludlow Ave.,
Indianapolis 7, Indiana
**Trade Name: Peerless**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| RCU-A-CB | RA 243-1 | | 24,000 |
| RCU-A-CB | RA 373-1 | | 36,000 |
| RCU-A-CB | RA 373-3 | | 36,000 |
| RCU-A-CB | RA 464-1 | | 45,500 |
| RCU-A-CB | RA 504-1 | | 60,000 |
| RCU-A-CB | RA 504-3 | | 60,000 |
| RCU-A-C | RA 243-1 | | 24,000 |
| RCU-A-C | RA 373-1 | | 36,000 |
| RCU-A-C | RA 373-3 | | 36,000 |
| RCU-A-C | RA 464-1 | | 45,500 |
| RCU-A-C | RA 504-1 | | 60,000 |
| RCU-A-C | RA 504-3 | | 60,000 |

**PERFECTION INDUSTRIES**
**DIVISION OF HUPP CORPORATION**
1135 Ivanhoe Road,
Cleveland, Ohio
**Trade Name: Perfection**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | PAS21A | | 24,000 |
| SC-A | PAS30 | | 36,000 |
| SC-A | PAS50A | | 60,000 |
| SC-A | 3PAS50A | | 60,000 |
| RCU-A-C | 1PAR31 | | 35,000 |
| RCU-A-C | 1PAR51 | | 57,000 |
| RCU-A-C | 3PAR31 | | 35,000 |
| RCU-A-C | 3PAR51 | | 57,000 |

**ROUND OAK COMPANY OF INDIANA, INCORPORATED**
Dowagiac, Michigan
**Trade Name: Round Oak**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| RCU-A-CB | RA 243-1 | | 24,000 |
| RCU-A-CB | RA 373-1 | | 36,000 |
| RCU-A-CB | RA 373-3 | | 36,000 |
| RCU-A-CB | RA 464-1 | | 45,500 |
| RCU-A-CB | RA 504-1 | | 60,000 |
| RCU-A-CB | RA 504-3 | | 60,000 |
| RCU-A-C | RA 243-1 | | 24,000 |
| RCU-A-C | RA 373-1 | | 36,000 |
| RCU-A-C | RA 373-3 | | 36,000 |
| RCU-A-C | RA 464-1 | | 45,500 |
| RCU-A-C | RA 504-1 | | 60,000 |
| RCU-A-C | RA 504-3 | | 60,000 |

**THE TRANE COMPANY**
Second and Cameron Avenue,
Lacrosse, Wisconsin
**Trade Name: Climate Changer**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-W | SC3 | | 38,900 |
| SC-W | SC5 | | 60,600 |
| SC-W | SC7 | | 88,200 |
| SC-W | SC10 | | 121,200 |
| RC-A | SA3 | AC3A | 31,200 |
| RC-A | SA3 | AC5A | 33,600 |
| RC-A | SA5 | AC5A | 48,000 |
| RC-A | SA5 | AC7A | 51,000 |
| RC-A | SA7 | AC7A | 75,000 |
| RC-A | SA7 | AC10A | 84,000 |
| RC-A | SA10 | 2-AC5A | 96,000 |
| RC-A | SA10 | 2-AC7A | 102,000 |
| RCH-W | SCX3 | | 38,900 |
| RCH-W | SCX5 | | 60,600 |
| RCH-W | SCX7 | | 88,200 |
| RCH-RCA | SAX3 | AC3A | 31,200 |
| RCH-RCA | SAX3 | AC5A | 33,600 |
| RCH-RCA | SAX5 | AC5A | 48,000 |
| RCH-RCA | SAX5 | AC7A | 51,000 |
| RCH-RCA | SAX7 | AC7A | 75,000 |
| RCU-A-CB | RUA2 | RL2 | 22,600 |
| RCU-A-CB | RUA2 | RL3 | 24,700 |
| RCU-A-CB | RUA3 | RL3 | 33,000 |
| RCU-A-CB | RUA3 | RL5 | 36,300 |
| RCU-A-CB | RUA5 | RL5 | 57,000 |
| RCU-A-C | RUA2 | RS2 | 22,600 |
| RCU-A-C | RUA2 | RK2 | 22,600 |
| RCU-A-C | RUA2 | RS3 | 24,700 |
| RCU-A-C | RUA2 | RK3 | 24,700 |
| RCU-A-C | RUA3 | RS3 | 33,000 |
| RCU-A-C | RUA3 | RK3 | 33,000 |
| RCU-A-C | RUA3 | RS5 | 36,300 |
| RCU-A-C | RUA3 | RK5 | 36,300 |
| RCU-A-C | RUA5 | RS5 | 57,000 |
| RCU-A-C | RUA5 | RK5 | 57,000 |

**WORTHINGTON CORPORATION**
Ampere Station,
East Orange, N. J.
**Trade Name: Worthington**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-W | SCY-44B | | 36,800 |
| SC-W | SCY-45B | | 36,800 |
| SC-W | SCY-47B | | 36,800 |
| SC-W | SCY-48B | | 36,800 |
| SC-W | SCY-49B | | 36,800 |
| SC-W | SCY-64B | | 56,500 |
| SC-W | SCY-65B | | 56,500 |
| SC-W | SCY-67B | | 56,500 |
| SC-W | SCY-68B | | 56,500 |
| SC-W | SCY-69B | | 56,500 |
| SC-W | SCY-84B | | 90,200 |
| SC-W | SCY-85B | | 90,200 |
| SC-W | SCY-88B | | 90,200 |
| SC-W | SCY-89B | | 90,200 |
| SC-W | SCY-1044D | | 112,500 |
| SC-W | SCY-1045D | | 112,500 |
| SC-W | SCY-1049D | | 112,500 |
| | Air-Conditioner | Condenser | |
| RC-A | SAC-44A | RAA-420 or RAA-420A | 33,000 |
| RC-A | SAC-45A | RAA-420 or RAA-420A | 33,000 |
| RC-A | SAC-47A | RAA-420 or RAA-420A | 33,000 |
| RC-A | SAC-48A | RAA-420 or RAA-420A | 33,000 |
| RC-A | SAC-49A | RAA-420 or RAA-420A | 33,000 |
| RC-A | SAC-64A | RAA-620 or RAA-620A | 50,300 |
| RC-A | SAC-65A | RAA-620 or RAA-620A | 50,300 |
| RC-A | SAC-67A | RAA-620 or RAA-620A | 50,300 |
| RC-A | SAC-68A | RAA-620 or RAA-620A | 50,300 |
| RC-A | SAC-69A | RAA-620 or RAA-620A | 50,300 |
| RC-A | SAC-84A | RAA-820 or RAA-820A | 81,000 |
| RC-A | SAC-85A | RAA-820 or RAA-820A | 81,000 |
| RC-A | SAC-88A | RAA-820 or RAA-820A | 81,000 |
| RC-A | SAC-89A | RAA-820 or RAA-820A | 81,000 |
| | Condensing Unit | Blower Coil | |
| RCU-A-CB | RAC-414A | CFC-407 | 32,500 |
| RCU-A-CB | RAC-415A | CFC-407 | 32,500 |
| RCU-A-CB | RAC-417 | CFC-407 | 32,500 |
| RCU-A-CB | RAC-417A | CFC-407 | 32,500 |
| RCU-A-CB | RAC-418 | CFC-407 | 32,500 |
| RCU-A-CB | RAC-418A | CFC-407 | 32,500 |
| RCU-A-CB | RAC-419 | CFC-407 | 32,500 |
| RCU-A-CB | RAC-419A | CFC-407 | 32,500 |
| RCU-A-CB | RAC-414A | RBE-407 | 32,000 |
| RCU-A-CB | RAC-415A | RBE-407 | 32,000 |
| RCU-A-CB | RAC-417 | RBE-407 | 32,000 |
| RCU-A-CB | RAC-417A | RBE-407 | 32,000 |
| RCU-A-CB | RAC-418 | RBE-407 | 32,000 |
| RCU-A-CB | RAC-418A | RBE-407 | 32,000 |
| RCU-A-CB | RAC-419 | RBE-407 | 32,000 |
| RCU-A-CB | RAC-419A | RBE-407 | 32,000 |
| RCU-A-CB | RAC-614A | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-615A | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-617 | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-617A | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-618 | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-618A | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-619 | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-619A | CFC-607 or RBE-607 | 49,800 |
| RCU-A-CB | RAC-814A | CFC-807 | 79,500 |
| RCU-A-CB | RAC-815A | CFC-807 | 79,500 |
| RCU-A-CB | RAC-818 | CFC-807 | 79,500 |
| RCU-A-CB | RAC-818A | CFC-807 | 79,500 |
| RCU-A-CB | RAC-819 | CFC-807 | 79,500 |
| RCU-A-CB | RAC-819A | CFC-807 | 79,500 |
| RCU-A-CB | RAC-814A | RBE-807 | 82,300 |
| RCU-A-CB | RAC-815A | RBE-807 | 82,300 |
| RCU-A-CB | RAC-818 | RBE-807 | 82,300 |
| RCU-A-CB | RAC-818A | RBE-807 | 82,300 |
| RCU-A-CB | RAC-819 | RBE-807 | 82,300 |
| RCU-A-CB | RAC-819A | RBE-807 | 82,300 |

**YORK CORPORATION**
**SUBSIDIARY OF BORG-WARNER CORPORATION**
York, Pennsylvania
**Trade Name: Yorkaire, Embassy Series**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-W | 354 | | 39,000 |
| SC-W | 554 | | 68,160 |
| SC-W | 752 | | 99,600 |
| SC-W | 1003 | | 130,800 |

**Trade Name: Yorkaire, Champion Series**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| RCU-A-CB | CA120-EB120 | | 122,000 |
| RCU-A-CB | CA50 -EB60 | | 63,300 |
| RCU-A-CB | CA75 -EB90 | | 96,300 |

**TYPHOON AIR CONDITIONING COMPANY**
**DIVISION OF HUPP CORPORATION**
505 Carroll Street,
Brooklyn 15, N. Y.
**Trade Name: Typhoon**

| Type | Designation (Model Number) | | Standard Rating B.t.u.h. |
|---|---|---|---|
| SC-A | TAS21A | | 24,000 |
| SC-A | TAS30 | | 36,000 |
| SC-A | TAS50A | | 60,000 |
| SC-A | TAS30A | | 60,000 |
| SC-W | H46SC | | 37,000 |
| SC-W | H66SC | | 60,600 |
| SC-W | H86SC | | 97,500 |
| SC-W | H117SC | | 125,000 |
| SC-W | H60CMU | | 60,600 |
| SC-W | H80CMU | | 97,500 |
| SC-W | H76SC | | 84,800 |
| SC-W | H96SC | | 101,750 |
| SC-W | H116SC | | 125,000 |
| RCU-A-CB | 3 ACCU | 31LSU | 37,000 |
| RCU-A-CB | 5 ACCU | 51LSU | 63,500 |
| RCU-A-CB | 8 ACCU | 81LSU | 95,600 |
| RCU-A-CB | 10 ACCU | 101LSU | 114,000 |
| RCU-A-C | 3TAR31 | | 35,000 |
| RCU-A-C | 3TAR51 | | 57,000 |
| RCU-A-C | 1TAR31 | | 35,000 |
| RCU-A-C | 1TAR51 | | 57,000 |
| RCU-W-CB | H46HS | 31LSU | 37,000 |
| RCU-W-CB | H66HS | 51LSU | 60,600 |
| RCU-W-CB | H86HS | 81LSU | 97,500 |
| RCU-W-CB | H116HS | 101LSU | 125,000 |

Eleven other companies are participating in the certification program, making a total of 31, according to ARI. The data on the 11 who have signed to participate but had not provided the test data at the time the first edition of the directory went to press, will be included in subsequent supplements. They are:

Curtis Mfg. Co.; Day & Night Mfg. Co.; General Automatic Products Co.; International Heater Co.; The Majestic Co., Inc.; The Mathes Co., Div. of Glen Alden Corp.; The Payne Co.; Rheem Mfg. Co.; A. O. Smith Corp.; United States Air Conditioning Corp.; and Westinghouse Electric Corp.

*You can't wrap the system in cellophane . . .*

**PROTECT IT WITH BANOX®**

Forms a molecular film on all metal surfaces contacted by recirculating water. Condenser, pump and water lines are protected against corrosion. Use at Spring start-up — after acid cleaning—at shut down. Get Banox from your Refrigeration Wholesaler today.

**CALGON COMPANY**
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
HAGAN BUILDING, PITTSBURGH 30, PA.
In Canada: Hagan Corporation (Canada) Limited, Toronto

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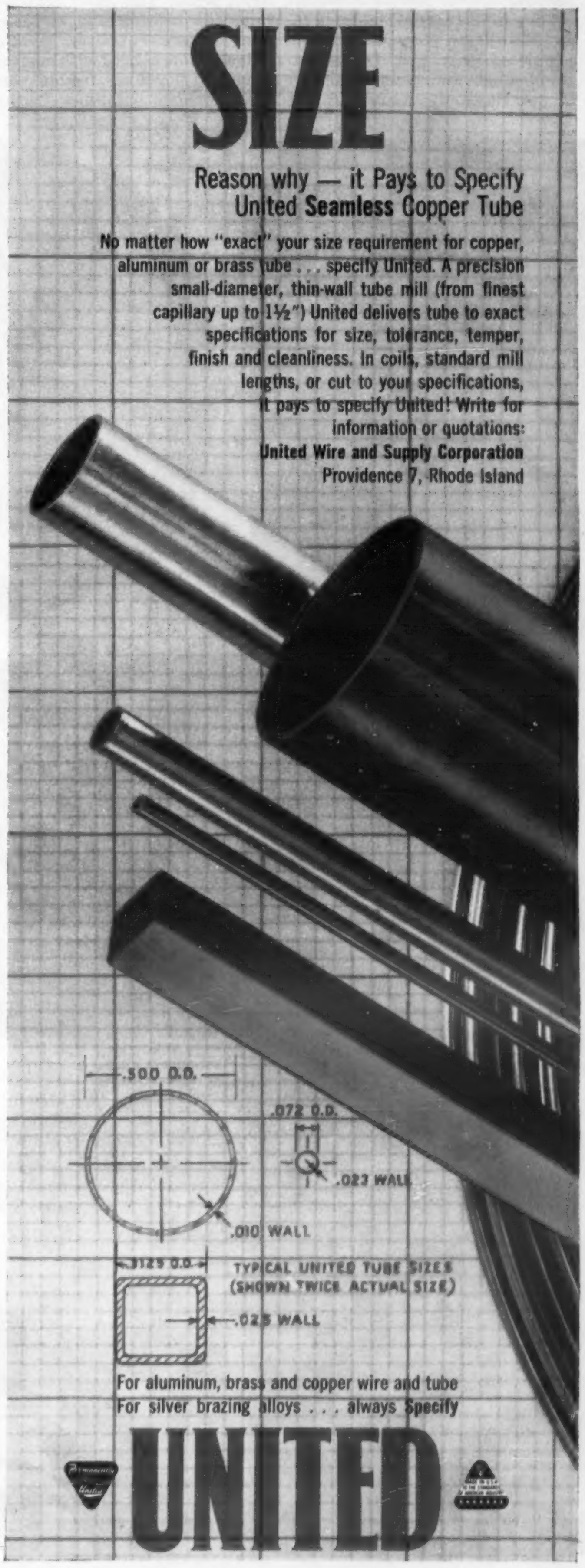

**SIZE**

Reason why — it Pays to Specify United Seamless Copper Tube

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Providence 7, Rhode Island

For aluminum, brass and copper wire and tube
For silver brazing alloys . . . always Specify

**UNITED**

# Heating, Ventilating Systems at Convair's Huge Atlas ICBM Plant Ready for Cooling

SAN DIEGO, Calif.—Largest and most modern facility in the free world for integrated research, development, and production of long-range missiles and space vehicles is the new Convair - Astronautics Kearny Mesa plant near here.

Carved out of brushland in less than two years, the sprawling, 20-building complex was constructed specifically for the development and pilot production of the U. S. Air Force Atlas intercontinental ballistic missile.

Four of six major buildings in the $40 million plant, which was completed only last December, are heated and ventilated by Drayer-Hanson systems and are ready for later addition of air conditioning.

These include two six-story structures for administration and engineering offices, a two-story reception center, and an engineering laboratory of unusual "waffle" design.

Other major buildings are a cafeteria and the 579,200-sq. ft. manufacturing building, constructed in 180-ft. spans to allow flexible working space for construction of large dimension missiles and astro-craft.

Hot water and, later, chilled water for heating and air conditioning are supplied from a central powerhouse, with underground utility lines feeding out to the various buildings. In the powerhouse are two 30 million B.t.u. high temperature boilers by Combustion Engineering, Inc. and a 500-ton capacity Carrier hermetic centrifugal water chiller.

A unique feature is that the system uses mechanical pressure rather than steam pressure and a single pump system.

In the six-story administration and engineering buildings —225 ft. long by 75 ft. wide— heating and ventilating is provided through two built-up systems in each building. Concrete shafts, lined with insulation, serve as extended plenums. From these shafts ducts take off to the 12 individually controlled zones on each floor. Each fan handles 63,000 c.f.m.

The two-story reception room is made unique by a 245-ft. vinyl-tiled spiral ramp suspended from the ceiling by stainless steel rods over a circular pool. The ramp leads to second floor conference room and affords access to the administration and engineering buildings on either side.

CENTRIFUGE for making acceleration tests on materials for space flights. Temperatures in pod can range from -100° F. to 350° F.

WAFFLE DESIGN of engineering laboratories that provide maximum light, air, and privacy for each office. They are connected by outside walks instead of internal hallways.

### Building Heated Through Double Plenum System

This building is heated through a double plenum system mixing air temperatures at the coils.

The single-story 292,900-sq. ft. engineering laboratory is laid out in a waffle pattern to provide maximum privacy, air, and light to each office. The design makes possible substitution of outside walks for internal hallways.

Into this complex, Drayer-Hanson has installed 48 HH series air handling units for single zoning each wing or part of a wing.

It has also installed 15 BT series units for multi-zone control with ducts to five or six sub-zones.

All units are hung overhead adjacent to outside wall areas so they can draw fresh air from outside.

The BT units are of special design, but are basically Drayer-Hanson's "Flexazone" series less discharge dampers and plenums. They have inverted fans operating on the blow-through principle. Four-row coils are used. Entering air is 60° F. and leaving air 100° F. Entering water is 115° F. and leaving water 95° F.

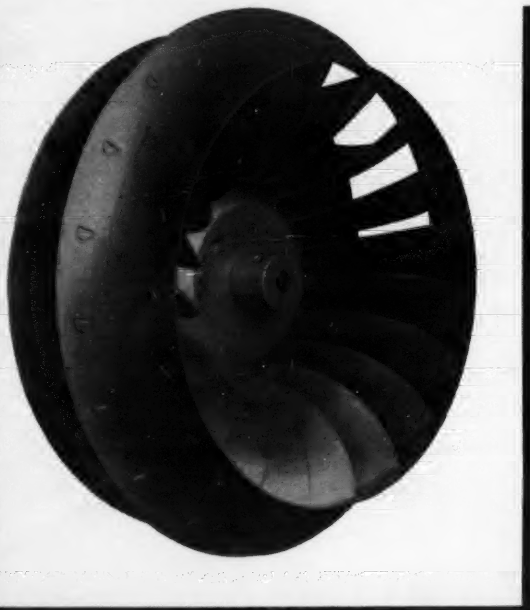
All have bottom access and are equipped with drain pan plugged with standard 1¼-in. pipe plug. There is a separate control for each zone and separate damper.

Largest single section of the engineering laboratory houses electronic computers to solve Atlas design and performance problems. Computer labs cover 28,800 sq. ft. of space.

In addition to heating, this area is cooled through Chicago Blower spray coil units.

One of Convair's smaller buildings is a centrifuge building where acceleration pressures of up to 100 times earth gravity can be simulated on missile components.

*(Continued on next page)*



TORRINGTON CRACKS THE NOISE PROBLEM The squeeze toward compactness in room air conditioners has forced the decibel level up to the point that *noise is now the No. 1 problem.* ▮ In anticipation of this trend, two years ago Torrington's air impeller laboratories went to work on "noise." ▮ The result is the revolutionary Torrington H Wheel – one of the most important breakthroughs in air conditioning history. ▮ In one room air conditioner application test the H Wheel reduced the noise level from 63 to 53 decibels; and it was less than *one half as loud.* ▮ Torrington's engineering department is now offering samples of the H-Series Wheel for evaluation in your new product development program.

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$\frac{1}{2}$

ONE of ceiling mounted Drayer-Hanson units now used for heating and ventilating but ready for air conditioning.

*(Concluded from preceding page)*

Equipment pod of the centrifuge can accommodate up to a ton of material. Temperatures in the pod can be varied from -100° F. to 350° F. for combined acceleration and temperature tests.

The heavily insulated pod is equipped with electric heaters, a refrigerant coil, and a circulating fan.

A two-stage cascade refrigeration system using "Freon-22" and "Freon-13" provides the cooling medium.

Interconnecting power, control, and refrigerant lines contain quick disconnect couplings that enable rapid disconnection after desired chamber temperature is attained.

Temperature is not controlled during an acceleration test. Pod is heated or cooled to the desired temperature immediately before the test. Insulation holds the temperature during the acceleration period.

The new Convair plant is located on Highway 395 immediately north of Montgomery Field. It is only 12 miles from the missile static test base at Sycamore Canyon.

Pereira & Luckman was architect for the plant and McNeil Construction Co. was general contractor. Climate Conditioning Corp. of West Los Angeles put in the heating and ventilating equipment supplied by Air Conditioning Supply Co. of Los Angeles.

Convair, just this month, was awarded a $35 million contract to develop and build an Atlas missile upper stage for distant space and low orbit satellite experiments.

# York Reports Order Backlog at New Peak

YORK, Pa.—Orders scheduled for delivery during the first quarter of 1959 are the highest in the 84-year history of York Corp., according to Austin Rising, vice president and director of marketing for the Borg-Warner subsidiary.

Rising said an important part of the record setting backlog of orders is in the packaged products heating and air conditioning lines. He credited the sharp upturn to "improved products, better selling, and a significant trend to multi-space application of packaged units."

Orders received during York's five regional distributor conventions at which the 1959 line was introduced were up 50% over the same period last year and are for delivery within a shorter period, it was reported.

Robert E. Cassatt, York's general sales manager for packaged products, said that although commercial air conditioning orders received during the last three months of the year are up 23% over the preceding year, the strongest gains have been in the residential field.

Room air conditioning sales during the last quarter were up "more than 25%," Cassatt said, while both furnaces and residential air conditioning have shown even larger sales gains.

Cassatt said that although all of the air conditioning units in the 1959 York line are extremely quiet and are being well received, orders for the new "Acoustamatic" models were particularly heavy. He credited this to the unit's rating of less than 52 decibels.

"We feel we are rapidly approaching the time when air conditioning will achieve the market penetration it deserves as a major comfort and convenience appliance," he commented. "We see more and more builders including air conditioning in the appliance package along with heating, cooking, and food refrigeration equipment.

Contributing to York's current increase in sales, Cassatt said, is the organized sales planning tailored for individual areas of the country.

He said there is "great enthusiasm among dealers for our 1959 advertising and sales promotion, including our participation in the Jack Paar TV show."

## 68 Honored at Binks' Service Award Dinner

CHICAGO — More than 100 employes of Binks Mfg. Co. attended the company's second annual service award dinner held recently at Chicago's Drake hotel.

The dinner was started last year as an annual event designed to give recognition to employes with large employment records. This year, a total of 68 persons received awards.

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AUTOMOBILE
AIR CONDITIONERS
*have more to offer!*

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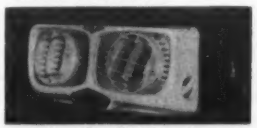
  AMERICAN CARS
  FOREIGN CARS
  (40 different makes)
  SPORTS CARS
- EASY TO INSTALL
  *Step by step illustrated instructions*
- MORE COOLING CAPACITY
  *World wide customer acceptance*
- NATIONAL AND LOCAL
  *Sales promotion*
- CHOICE OF UNITS
  *2 underdash models*
  *1 Deluxe trunk unit*
  *Custom Built units*



Iceberg Fan Model as shown

*FOR COMPLETE DETAILS FOR DEALERSHIPS CONTACT*

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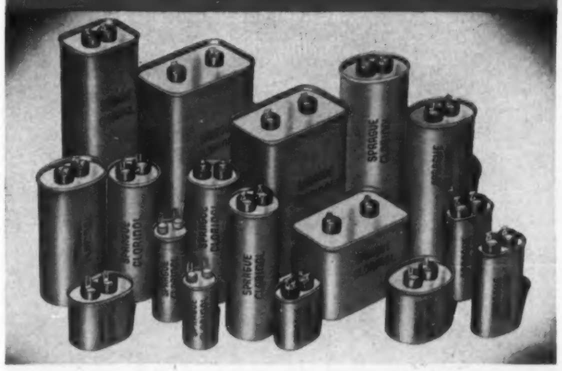
3922 KALLOCH DRIVE, DALLAS, TEXAS
Phone FR 1-3471

MOTOR-RUN CAPACITORS

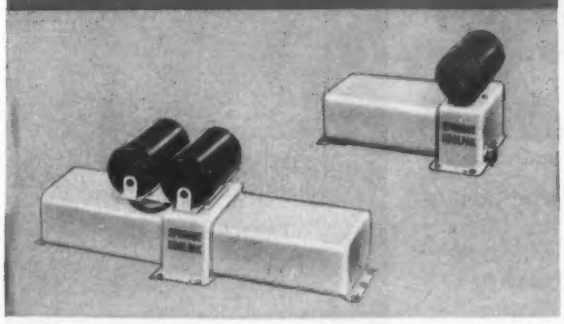
for air-conditioning, refrigerators, motors, heat pumps, specialty transformers, voltage regulators, controls, and general purpose a-c applications

CLORINOL® Capacitors



CLORINOL Capacitors are designed to save both space and weight and to help reduce costs in many typical a-c applications. Their drawn seamless steel cases make them extra sturdy, extra compact. They're made to resist corrosion . . . to take hard knocks and bangs . . . to withstand gruelling duty cycles. Double-rolled edges of the cover closure eliminate "pop-outs". The unique welded terminal assembly forms a dependable leakproof seal. The impregnant is a non-flammable synthetic liquid of high dielectric strength. Dual-blade universal terminals fit both popular types of female quick-connectors. Available in all the popular ratings and in three case styles—oval, rectangular, and cylindrical. Request Engineering Bulletins No. 4500 (general data), 4510 (oval), 4520 (rectangular), and 4530 (cylindrical).

KOOLPAK® Capacitor Assemblies



KOOLPAK Capacitor Assemblies provide complete motor-start and motor-run capacitance in one, easily installed unit that's perfectly matched to your requirements. The capacitors in each assemblyare completely exposed for cooler operation. The internal heat is dissipated quickly by conduction and convection. These cooler-running capacitors last from two to three times longer than those that are stuffed into conventional box packages. KOOLPAK assemblies cost you less because there's no outer box, no special leads or terminals to buy for interconnecting multiple capacitors. All units are finished to pass Article 207 of Underwriter Laboratories', Inc., requirements for air conditioners. Request Engineering Bulletin No. 4900A.

Sprague—*the world's largest manufacturer of capacitors*—has a complete line of motor-starting and motor-running capacitors. Write for Engineering Bulletins and application assistance. Address request to Technical Literature Section, Sprague Electric Co., 63 Marshall Street, North Adams, Mass.

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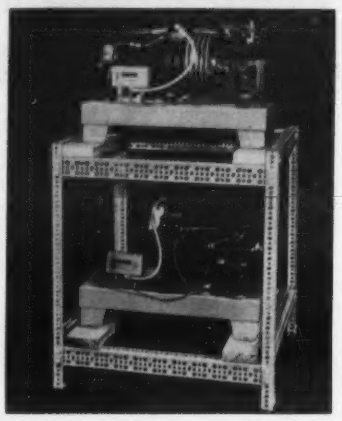
## Compressor Rack Kit Offers Savings

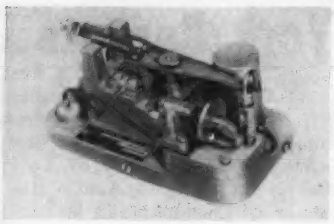


● Introduction of pre-engineered "AIM Brand Slotted Angle" compressor rack kits for the refrigeration industry has been announced by Acme Steel Co., Dept. AH&RN, 135th St. and Perry Ave., Chicago 27.

The rack kits, of particular use for mounting compressors, condensers, and other refrigeration equipment, give contractors and users important installation savings, the company claims. They are said to provide additional economies because they minimize detailed planning and require only bolting for complete rack assembly.

Three types of racks have been designed "to accommodate any size condenser or compressor." Each rack kit contains precise lengths of slotted angle, nuts, and bolts for complete assembly of the basic rack, the company said. Illustrated assembly plans are furnished with each kit.

**For Your Reprint Copy**
"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
Only 25¢ each.

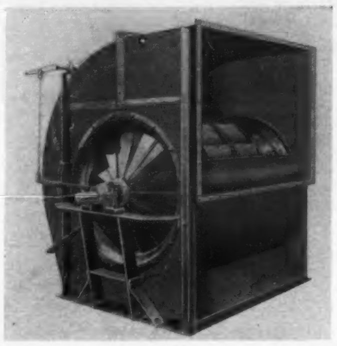


## 'Sensair' Features Simplicity, Economy

● A new "Sensaire" temperature transmitter "of particular interest to anyone with low cost temperature measurement requirements in the -30° F. to 1,200° F. range" has been announced by Taylor Instrument Cos., Dept. AH&RN, 95 Ames St., Rochester 1, N. Y. The unit is claimed to offer versatility and simplicity.

"A thumb-screw adjustment zero sets over a wide range. Further range limits and operational spans can be established as needed, right in the field," the company said.

## Fan Designed To Reduce Turbulence to Minimum



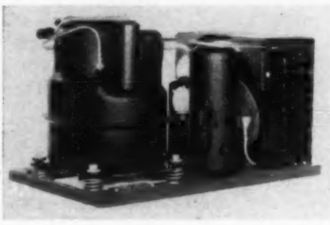
● Incorporating an "advanced" airfoil, backward curved blade design, the type AF "Dynafoil" fan has been announced by Clarage Fan Co., Dept. AH&RN, Kalamazoo, Mich.

"The Dynafoil wheel is built with 12 aerodynamically shaped blades which in combination with the streamlined contour of the inlet permits continuously smooth flow of air through the fan," it was pointed out. "Turbulence is consequently reduced to a minimum.

"The airfoil shaped blades are of one-piece die formed construction. They are welded to the rim and backplate.

Internal struts inside the hollow section are provided in blades of fans to obtain higher tip speed classes."

Dynafoil fans are offered in 13 sizes for mechanical draft and in Classes II, II, and IV for heavy-duty industrial applications. They are also adapted to conduit type air conditioning systems and tunnel ventilation.

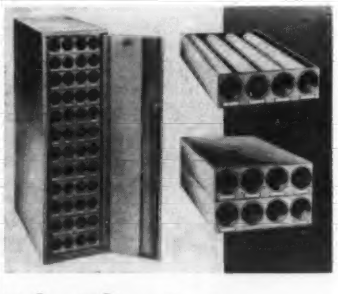


## B-W Bows ½-Hp. Model With Twin Cylinder

● A compact, ½-hp. model condensing unit, recently released, features a twin cylinder motor compressor designed for low temperature applications using Refrigerant-12, according to Evansville Div., Bendix-Westinghouse Automotive Air Brake Co., Dept. AH&RN, 950 East Virginia St., Evansville 11, Ind.

The new unit supplements the single cylinder line of condensing units in the ½-hp. size. R-12 models are now available for both high and low temperature work, according to the firm.

The new model, designated BRL50T, can be supplied in specified voltages of 115 or 230. This unit employs a high starting torque motor and incorporates many exclusive features such as built in liquid level test port, the company said.



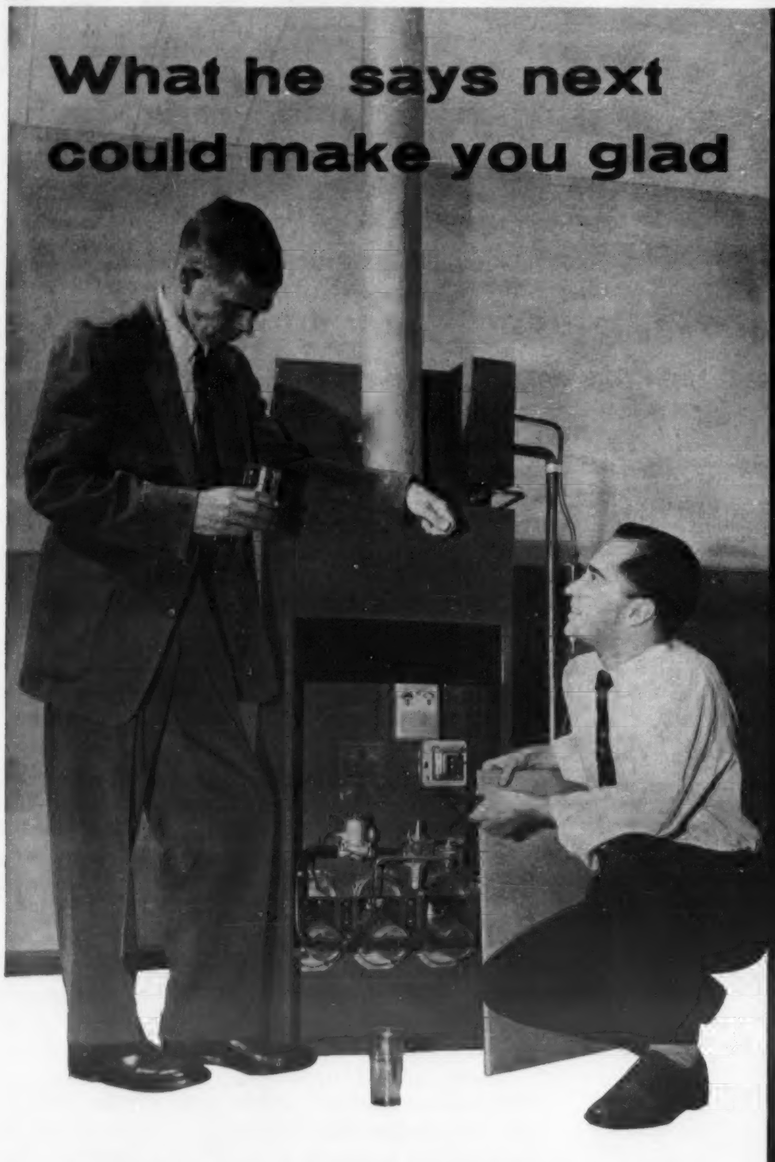
## Tube Filing System For Drawings Available

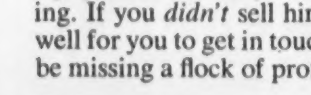
● A new tube filing system for rolled prints, charts, drawings, maps, and tracings has been introduced by Plan Hold Corp., Dept. AH&RN, P.O. Box 1038, South Gate, Calif.

"Roll File" consists of modular steel encased "Duro" tubes in units of four tubes per Roll File. Roll File units measure 12 in. wide by 4 in. high by tube length.

These 2⅝ in. inside diameter tubes are currently offered in two tube lengths, 27 in. and 33 in., according to the manufacturer.

Special "slide together" stacking feature enables Roll File units to be assembled for desk top mounting or under-surface table mounting by means of a special slide-on top which is provided with mounting holes for suspension. A steel filing cabinet with cylinder lock in handle is available. This cabinet will accommodate a total of 12 Roll File units (48 individual tubes).





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- Completely welded construction
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- Basement, closet, attic or subfloor installation
- American Gas Association and Underwriter Laboratories approved
- The QUIETEST air conditioning made
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The proud host shows the curious guest the air conditioning furnace you sold h:m. Here's where sales are often made or lost forever. Will the host say: "Plenty of heat in every room . . . can't even hear it . . . low cost performance . . . no mechanical trouble . . . house stays clean . . . and you can add cooling later"?

If so, you should be glad you sold him FRASER-JOHNSTON equipment. You may have another customer in the morning. If you *didn't* sell him FRASER-JOHNSTON, it might be well for you to get in touch with us right away — you could be missing a flock of profitable sales!

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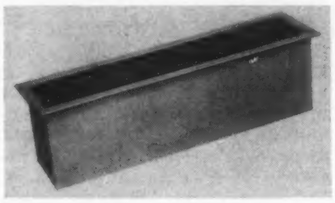


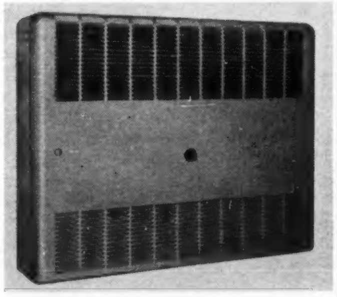
## Electric Floor Insert Heaters Introduced

● Electric floor insert heaters are being offered by Electrovector, Inc., Dept. AH&RN, 475 Flushing Ave., Brooklyn 5.

"Floor insert heaters are desirable where floor-to-ceiling window areas make the electrical baseboard installation impractical," the company said. "New engineering features give an effective blanket of heat directly in front of floor-to-ceiling windows."

Another feature: "Automatic safety cut-off in the event a rug, newspaper, magazine, or drape covers the heater."

Models range from No. FH 350 (1,194 B.t.u.) 14 in. width, 9½ in. high, 6 in. depth; No. FH 750 (2,559 B.t.u.) 30 in. width, 9½ in. high, 6 in. depth.

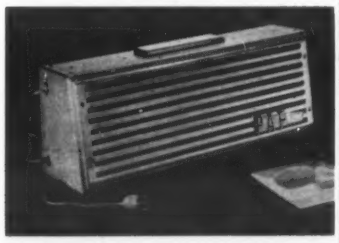


## Cooling-Heating Units Offered In 2 Sizes

● Dunham-Bush, Inc., Dept. AH&RN, West Hartford, Conn., has introduced "CHC" cooling-heating conditioners which are manufactured in two sizes, models CHC-150 and CHC-300.

These units are especially designed to meet the smaller space and capacity requirements of hotels, motels, apartments, and residences, it was explained. Together with Heat-X water chillers, Dunham-Bush pumps and water savers all the necessary equipment to meet complete system specifications are provided, the company said.

"Designed basically for free standing use readily adaptable for semi-recessed, 'between the stud,' applications, these standard units can be wall mounted, fully exposed or semi-recessed, as required for 'off the floor' installations," it was stated. "Matching trim pieces are available for finishing purposes on semi-recessed applications."

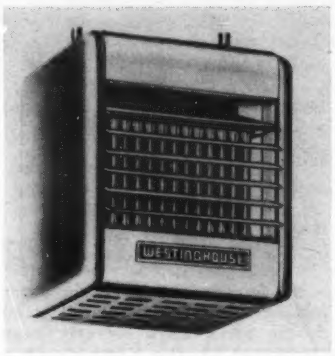


## PAF Room Air Purifier Uses Activated Charcoal

● Pafcon Products, Inc., Dept. AH&RN, 309 Fifth Ave., New York City, is introducing the PAF room air purifier designed to remove odors and irritants from the air by filtration through activated charcoal.

The model B PAF, designed for a 15-ft. by 15-ft. room, is completely portable and will sell for $39.95 at retail, the company said.

## Gas-Fired Unit Heaters Available In 10 Sizes



● A new line of gas-fired unit heaters, in 10 sizes from 25,000 to 250,000 B.t.u.h., is now available from Westinghouse Electric Corp.'s Sturtevant Div., Dept. AH&RN (T-402), 200 Readville St., Hyde Park, Boston 36.

These heaters incorporate a contoured aluminized-steel heat exchanger design with combustion occurring within individual tubes for maximum heat transfer, the company said.

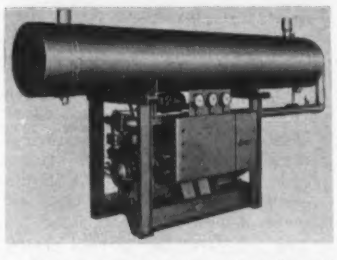
The units are all equipped with fully automatic, positive safety controls and are available for any type of gas specified: manufactured, natural, mixed, liquid petroleum gas, and liquid petroleum gas-air mixtures, it was stated.

The fan motors are standard rated at 115 volts, 60 cycle, single-phase current and are equipped with automatic reset-type thermal overload protection. The seven smaller units have a permanent lubricated shaded-pole motor. The three larger units have permanent capacitor motors requiring periodic lubrication.

All units are equipped with adjustable louvers.

**More details on the products described on this page may be obtained by writing the manufacturer at the address given in each story.**

## American Blower Redesigns Packaged Chillers



● A redesigned line of packaged water chillers for air conditioning or industrial cooling applications is now available from American Blower Div., American-Standard, Dept. AH&RN, Detroit 32.

Designated type CD, the new chillers are available in nine sizes from 20 to 125 hp. The new design retains copper tubing with a star shaped aluminum insert within the evaporator for greater cooling capacity.

Typical of the new features is the capacity control which is actuated by crankcase suction pressure, it is pointed out.

"The compressor is directly driven by an electric motor through a flexible coupling," it was explained. "This high-speed direct-drive compressor allows the unit to be more compact and reduces the shipping and operating weight. The compressor is protected by the use of a pump-down cycle and crankcase heater(s).

"Trouble indicator lights are an added feature of the redesigned chiller models. Should an abnormal condition cause the unit to cut off on any of the four safety controls, the appropriate indicator light will come on to identify the source of the trouble."

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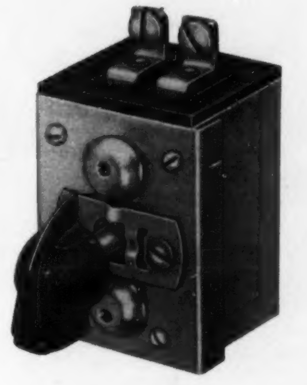
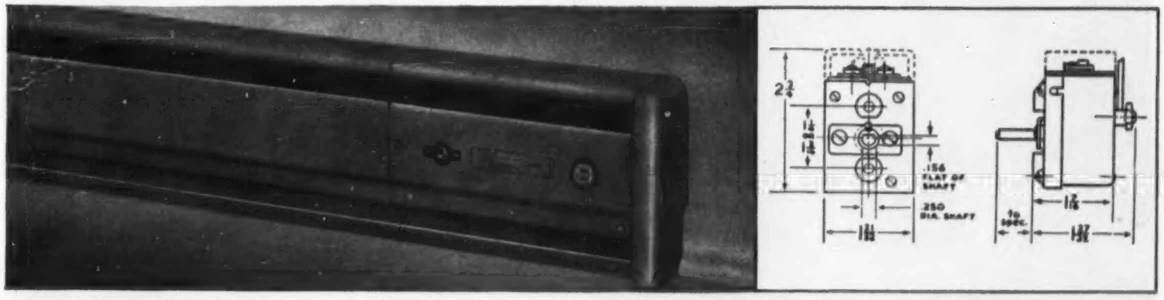
HELPS YOU DESIGN MORE COMPACT HEATING CONTROLS



SINGLE-POLE, REMOTE-BULB UNIT COMBINES SMALL SIZE, HIGH CAPACITY, LOW COST

*Photo courtesy Electromode Division of Commercial Controls Corporation*



Combination of small size and high capacity offered by new Wilcolator G1 Thermostat is used to advantage in compact control panel of Electromode baseboard heater.

Because of its improved-design, snap-action switch mechanism, the new Wilcolator Type G1 Thermostat provides significantly higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). Thus you can utilize this new thermostat to design smaller, more efficient control panel assemblies for space heaters, ranges and similar appliances. At the same time, you can also reduce costs, because the G1 is generally priced lower than its bulkier counterparts.

The Wilcolator G1 Thermostat gives you accurate temperature control of practically any electrically heated medium—liquid, solid or gas—from 0 to 585°F. Its contacts are vibration proof and will not cause radio or TV interference. Temperature differential is adjustable and can be factory set to your specifications. Switch mechanism includes positive Off position.

For further information, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N.J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont. *Export:* Wilcolator, 1010 Schaff Bldg., 1505 Race St., Philadelphia 2, Pa.

**SPECIFICATIONS**

Temperature ranges: 0°F min.; 585°F max. Special temperature ranges: to customer's requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to customer's requirements. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

THE Wilcolator COMPANY

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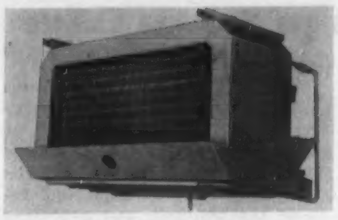


## New Hot-Gas Defrost Product Coolers Bowed

● A new series of "Krack" low temperature, hot-gas defrost product coolers has been announced by Refrigeration Appliances, Inc., Dept. AH&RN, 901 W. Lake St., Chicago 7.

Available in multiple and single fan models, the units are particularly adaptable to warehouses, supermarkets, sharp freezers, ice cream hardening rooms, and locker systems. They are capable of maintaining low temperatures and higher temperatures up to 34° F. with a minimum variation in humidity, the company claims.

## Dehumidifying Units Use Liquid Absorbent Spray

● New models of its "Controlled Humidity Method" dehumidifying units are being announced by Niagara Blower Co., Dept. AHRN, 405 Lexington Ave., New York City 17.

With this equipment moisture is removed directly from atmospheric air by means of a liquid absorbent sprayed in the air stream, it was explained.

The temperature of this spray, in contact with the air determines the dry-bulb temperature of the air leaving the conditioning unit. The concentration of the absorbent liquid spray controls the air's dewpoint temperature, thus fixing its relative humidity.

"In this way," the company said, "full automatic control of the temperature and relative humidity of the air is secured by thermostats, no moisture-sensitive instruments being required.

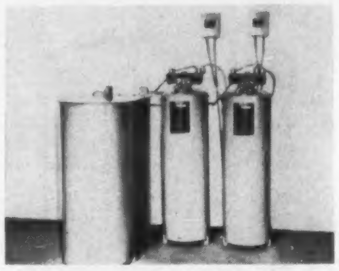
"The necessary concentration of the absorbent is obtained by continuously cycling the diluted absorbent through a concentrating unit that removes the water from the system at the same rate in which it is taken up by the concentrator."

## Pipe Hanger Ring Is Adjustable, Universal

● A universal adjustable pipe hanger ring has been developed by the "Auto-Grip" Div. of "Automatic" Sprinkler Corp. of America, Dept. AH&RN, Youngstown 1, Ohio.

The ring consists of a metal band and a locking insert for attachment to a threaded hanger rod. The insert is self-locking through spring action as well as through the weight of the pipe.

## New Water Softeners Are Fully Automatic

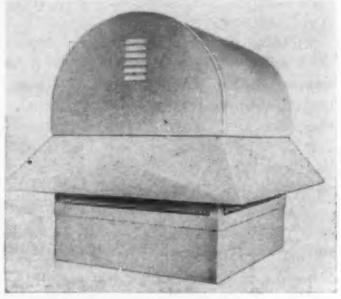


● New fully automatic water softeners, in both single and double units, have recently been introduced by The F. E. Myers & Bro. Co., Dept. AH&RN, Ashland, Ohio.

The units are said to be capable of softening water at service flow rates to 52 gals. a minute. Uses include treatment of water in conjunction with refrigeration and air conditioning systems.

Four basic units are available with capacities ranging from 69,000 to 430,000 grains of hardness between regenerations. A timing clock automatically begins the regeneration at a predetermined time of the day or night selected. The frequency of regeneration may be set at each 1, 2, 3, 4, 6, or every 12 days depending upon requirements.

Equipped with a new "obround" brine tank, the softeners offer a variety of installation possibilities to conform to space requirements, according to the company.



## Roof Ventilators Move Large Volume

● Just introduced by Power Line Fan Co., Dept. AH&RN, Plainfield, N. J., are an all new series of direct drive and belt drive centrifugal roof ventilators "designed to move large volumes of air quietly and continuously at moderate static pressures."

The units are recommended particularly for commercial and industrial ventilating systems.

Among features of the ventilators are all steel housing, with entire unit completely weatherproof; bird screen of ½-in. mesh, mounted in a vertical plane on the sides of the wheel compartment provided as a standard item; airfoil contoured wheel blades; and "floating" wheel and drive motor assembly.

## Duct Sealing Tape Is Vinyl Coated

● Availability of a new vinyl coated, pressure-sensitive duct sealing tape has been announced by Permacel, Dept. AH&RN, New Brunswick, N. J.

Designated Permacel 676 silver duct sealing tape, the product is specifically designed as a means of joining and sealing sections of ductwork in heating, ventilating, and air conditioning systems.

"The combination of cloth backing and a specially compounded adhesive provide an effective seal against air leaks and insure permanence on the job where sealing of joints and sections of ductwork are indicated," the company said. "Permacel 676 unwinds easily from the roll permitting quick, easy application."

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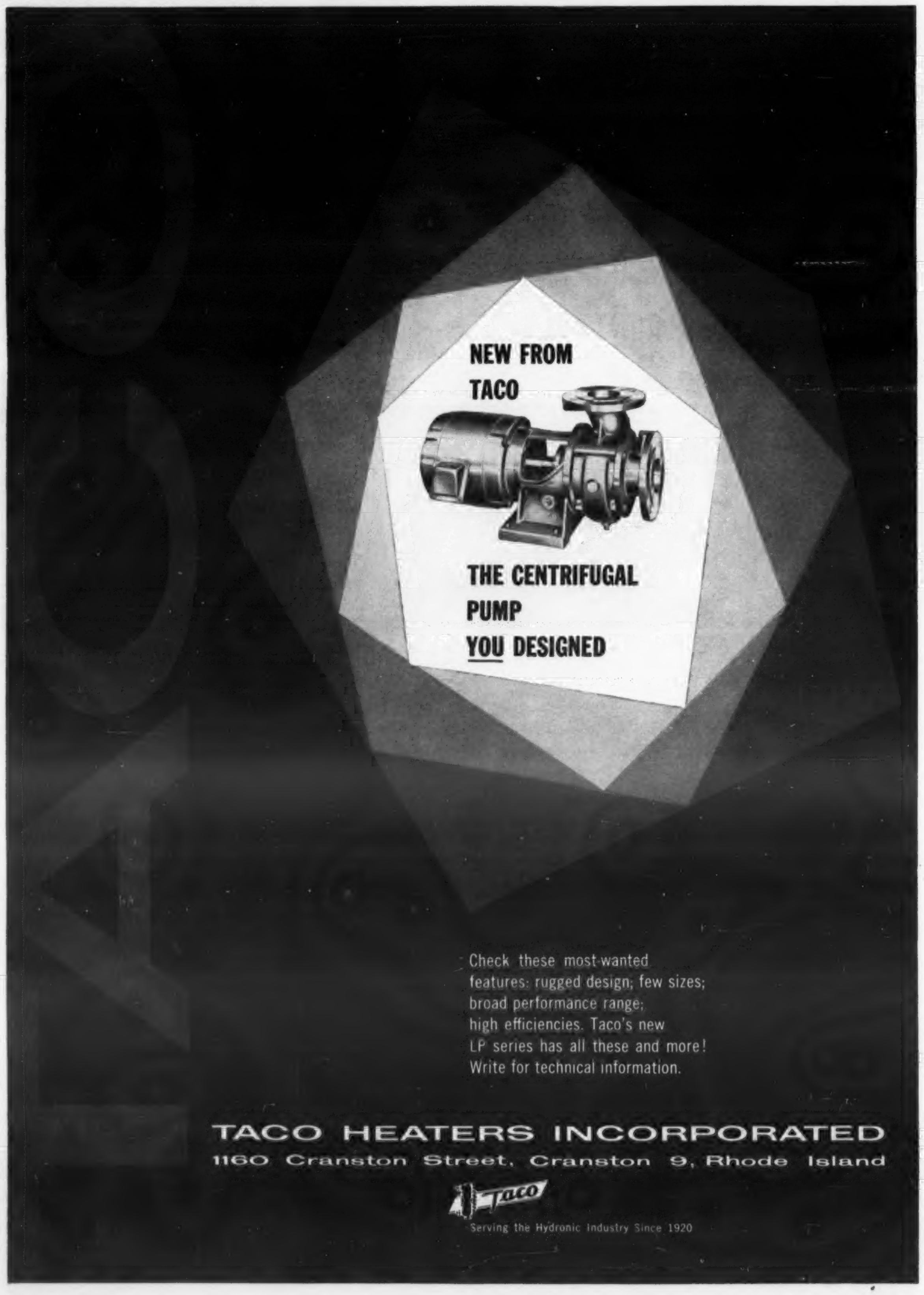

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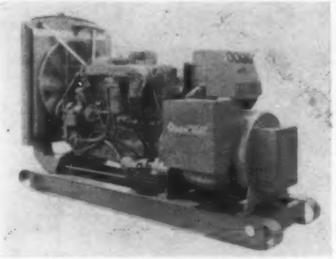
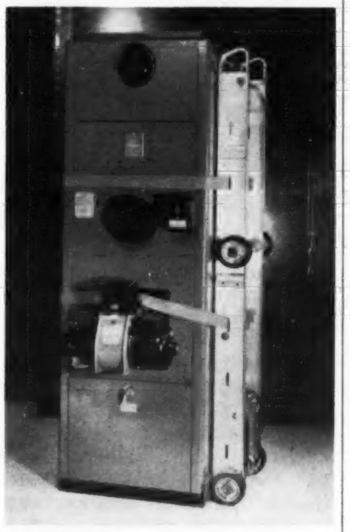


## Adds New Diesel-Driven Generating Plants

● Eight new series of Diesel-driven electric generating plants, from 50,000 to 200,000 watts, have been announced by D. W. Onan & Sons, Inc., Dept. AH&RN, Minneapolis 14.

The new generating sets "have been developed especially to meet the demands for auxiliary Diesel emergency electric power in our modern institutions, hospitals, chemical plants, public buildings, industries, and utilities wherever dependable standby electric power insurance is desired and needed," it was pointed out.

"With this increased capacity, Onan Diesel-driven standby plants now have the necessary power to operate essential electrical loads such as automatic heating systems, air conditioners, elevators, communications systems, motors, and lights for as long as these services are required."



## Yeats Offers Dolly for Heavy-Duty Applications

● A ½-ton capacity Yeats dolly, specially designed for easier handling of heavy home equipment such as heating and cooling units, upright freezers, plumbing fixtures, and vending machines is being offered by Yeats Appliance Dolly Sales Co., Dept. AH&RN, 2124 N. 12th St., Milwaukee 5.

This new heavy-duty model has such features as two ratchets and two sets of wheels for rolling instead of lifting the load. Two strap ratchets (each ratchet has its own heavy 14-ft. web strap) assure a positive grip on all units, the company said.

The Number 9 "Heavy Duty" is 71 in. tall and weighs 50 lbs.

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- **expanding your territory**
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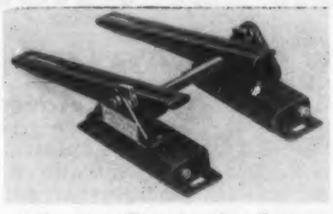
## Tension Control Bases Take Motors Up to 100 Hp.



● Three new sizes of tension control motor bases that can handle NEMA frame motors up to and including 100 hp. are available from The American Pulley Co., Dept. AH&RN, 4200 Wissahickon, Philadelphia.

Previously 30 hp. was the largest size motor that could be mounted in these automatic, belt-tensioning motor bases.

Each of the three new sizes consists of a cradle-type motor base supported on built-in slide rails with screw take-up. There is also a lateral adjustment for belt alignment, according to the firm.

The three motor bases, designated the "Econ-O-Matic" 9K, 11K, and 13K, take NEMA motor frame sizes up to No. 405, No. 445, and No. 505, respectively.

## 'Photoneering' Aids Use of Drawings

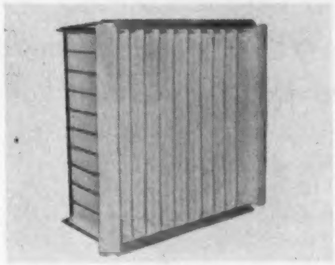
● Easier and more effective use of engineering drawings has reportedly been made possible with the introduction of "Photoneering," a new process that combines photography and drawing.

This method is being offered by Technical Reproduction Service, Dept. AH&RN, 375 South St., Newark 5, N. J.

"Specifications can be drawn directly on a photograph taken from any angle or point of perspective," it was explained. "A special heat and humidity resistant plastic film sheet is used, to permit changes or erasures."

It is said to be useful in plant modifications, model layouts, new products, and field changes.

## Disposable Dry-Type Filter Features Economy



● A disposable, dry-type filter for use wherever extra air cleaning efficiency (over 35% atmospheric) is required has been announced by Farr Co., Dept. AH&RN, P.O. Box 90187, Airport Station, Los Angeles 45.

Major economics result from the low cost of the filter unit itself and the time saved in changing filters, according to the manufacturer.

"The new HP-2 High Performance filter consists of deep folded pleats of special media which are permanently attached, top and bottom, to chipboard panels," the announcement said.

"It is completely flame-proof and tear-proof. The filter fits into a matching metal retainer which can be permanently attached to most existing filter holding frames.

"The HP-2 is pre-formed, then folded and packed, 10 to a carton. At the filter bank the HP-2 is simply popped open and inserted in the retainer. No special tools or skills are required for installation.

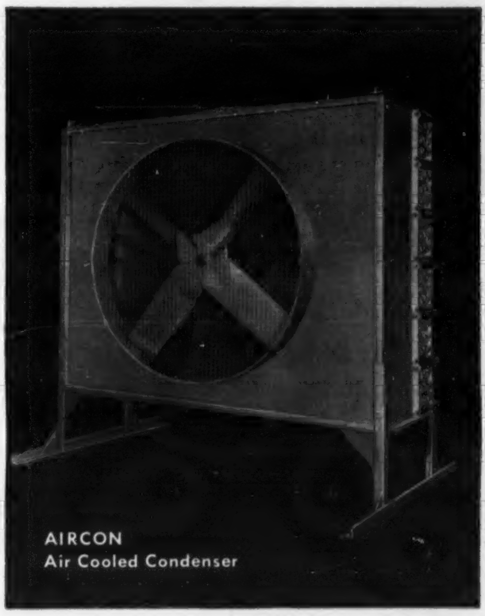
"Folding simplifies handling and reduces storage space."

**Want More Dope?**

***ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.***

***Tell him: "AH&RN sent me!"***

MORE *Models*
MORE *Capacity*
MORE *Performance*



AIRCON
Air Cooled Condenser

McQuay AIR COOLED CONDENSERS

UP TO 50 TONS IN A SINGLE UNIT—UNLIMITED CAPACITY IN MULTIPLE INSTALLATION

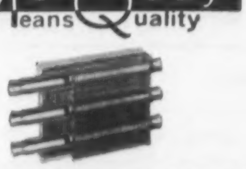
**McQuay Aircon** remote waterless condenser. Ten models, 3 to 50 ton capacity. Belt or direct drive models. Lifetime ball bearing and slow speed propeller type fans. McQuay Seasontrol modulates condenser capacity in accordance with weather for peak performance all year 'round.

WHEN you use McQuay Aircon air cooled condensers you have 10 models to choose from and you get from 3 ton to 50 ton capacity in a single unit! With multiple installations, capacities are unlimited.

You not only get more models and more capacity but you get more performance, because McQuay Aircons have the exclusive McQuay Ripple Fin coils—the finest and the standard of the industry.

With the present emphasis on remote waterless condensers, look to McQuay. Compare construction, compare features, compare the all around quality. Belt or direct drive models are offered. See your McQuay representative or write McQuay, Inc., 1607 Broadway Street N.E., Minneapolis 13, Minnesota.

McQuay
Means Quality



McQuay units feature the exclusive Ripple Fin Coils which create maximum air turbulence and have wide, full fin collars that act as automatic spacers to form a tube around the coil tube for greatest heat transfer and protection.

McQuay INC.

AIR CONDITIONING • HEATING • REFRIGERATION

# Air Conditioned Van for Atomic Age

## *Hottel Unit Will Maintain Humidity, Temperature Levels at Ambients From -60°F. to 125°F.; Attain High Capacity Under Adverse Conditions*

U. S. ARMY Chemical Center's atomic radiation van, which measures fall-out has special air conditioning unit mounted inside the trailer.

SILVER SPRING, Md. — A rugged air conditioning unit designed to maintain comfort conditions in a van type semitrailer filled with electronic equipment under extremes of hot and cold ambient temperatures has been produced by Harvey Hottel, Inc. here.

A. Merrill Rouse, in charge of research and development for Hottel, said the unit was originally designed for the U. S. Army Chemical Center's atomic radiation van which measures "fall out." Components were mounted inside the trailer.

He claimed that in an atomic bomb test on Eniwetok atoll, this was the only unit in a total of 90 vans that supplied continuous, trouble free operation.

Special features include humidity control, cooling and heating from -65° F. to 125° F. ambient temperature, two independent cooling and heating stages, and a time delay between stages to prevent a high surge on electrical circuits.

Other applications for the unit, he believed, would be for medical or dental vans or any van that goes into remote areas and has a high heat load.

To attain high capacities under adverse conditions, the unit —called the HAC-8V—uses R-12 in an R-22 compressor so that it can operate at higher head pressures. Expansion valves have been modified to operate under conditions of salt spray and fungus. Oversize condenser is used to handle high heat loads.

Where possible, standard parts are used so that replacement is no problem, Rouse said.

The air conditioning unit measures 80 in. wide by 79 in. high by 32 in. deep or to customer's dimensions. It is mounted on a rugged steel or lightweight aluminum frame with steel or aluminum panels.

The unit has two separate refrigerating systems, each operating independently of the other, except that they are connected to the same control system.

The unit is wired for operation of three-phase, 60-cycle, 208/220-volt, four-wire power supply, or as specified.

Various functions are controlled by a selector switch mounted on the control panel. The switch has four positions. These are "off," "service," "ventilate," and "condition."

With the switch in service position, each component can be operated manually and independently by use of service switches.

Service switches are interlocked with evaporator fan motor to prevent compressor or heater operation without evaporator fan running. Evaporator fan must be running before any other service switch will operate.

In ventilate position, evaporator blowers are started and will continue to operate until selector switch is moved to another position.

In condition position, operation of all components is controlled by the thermostat and humidistat in the conditioned space. Evaporator fans will continue to operate continuously. All other components will cycle on demand of thermostat and humidistat.

The Barber-Colman thermostat positions a Barber-Colman proportioning motor which directly operates four program switches: two for heating and two for cooling.

Humidity is controlled by two Barber-Colman humidistats — one for humidification and the other for dehumidification. Any desired humidity from 25% to 95% can be maintained, Rouse declared.

Changeover from heating to cooling and from humidifying to dehumidifying is completely automatic.

Dehumidification thermostat energizes the second stage compressor. The thermostat operates the heat if necessary to maintain temperatures.

Humidification humidistat operates the humidifier provided the second stage compressor is not in operation. This prevents humidification and dehumidification at the same time.

The air conditioning unit is equipped with a centrifugal type humidifier. It is located on top of the humidifier tank below the evaporator blowers. The tank will not freeze in cold weather if the unit is in operation, Rouse said, as it is in the warm air stream from the trailer.

### How Cycles Operate

This is the way the cooling and heating cycles operate:

When the temperature at the thermostat is below its setting, holding coils of the heating relays are energized and holding coils of the cooling relays are de-energized. Both stages of electric heaters are in operation.

There are nine electric heaters of the finstrip type. They are located on the leaving air side of the evaporator coil.

As the temperature in the conditioned space rises to the setting of the thermostat, the thermostat positions in the modulating motor to balance with the space temperature.

As the modulating motor rotates, it turns the shaft at the program controller whose cams de-energize the second-micro-

NEW

ADVANCED DESIGN—

FURNAS ELECTRIC CONTACTORS For AIR CONDITIONING, REFRIGERATION, HEATING

These compact contactors are designed for heavy duty service and can be mounted in any position.

- 20, 30, 40 amp, 2, 3, and 4 pole devices all have interchangeable mounting dimensions.
- Molded coil is moistureproof, available with screw terminals, quick connect terminals or leads.
- Magnet design has "No Kiss Potential" feature—positive pull in and drop out. Low inrush characteristic.
- Contactor is not a "throw-away" device. Coils and contacts can be readily changed in the field.
- UL Listing.
- 550 Volt Ratings.
- Pressure connectors on all poles eliminate necessity of looping and bending wires.
- Auxiliary terminals available on all contactors.
- Normally closed poles available.
- Contacts are visible and easily inspected.
- Lugs available on all 40 amp devices to accommodate up to #6 wire.
- One-piece molded arc box and base construction assures positive alignment.
- Available in Open and Nema I enclosed types. Wrap-around cover facilitates ease in wiring.
- Contacts are of premium-grade Silver-Cadmium Oxide material. All contact springs are stainless steel.

STYLE 41EB30AJ
AMPERE RATING
VOLTS
FULL LOAD
LOCKED ROTOR
240
40
200
550
20
100
BREAKING ALL LINES
FURNAS ELECTRIC CO. BATAVIA, ILL.
D15408-1
REAR
TERMINALS
T3
T2
T1
FRONT
UP
L3
L2
L1

CLASS 41
ACTUAL SIZE

Furnas also features a complete line of controls for your particular application. Some of these are:

—20, 30, 35, 50 amp current rated starters for use with hermetic motors.
—Industrial starters through 100 HP.
—Part-winding starters, through 200 HP.
—Reduced voltage primary resistance starters.
—Reduced voltage autotransformer starters.
—Special Control Panels.

CONTACTOR RATINGS

| RATINGS | 20 AMP | | 30 AMP | | 40 AMP | |
|---|---|---|---|---|---|---|
| | 240 V | 550 V | 240 V | 550 V | 240 V | 550 V |
| FULL LOAD | 20 | 10 | 30 | 15 | 40 | 20 |
| LOCKED ROTOR | 120 | 60 | 180 | 90 | 200 | 100 |

SPECIFICATIONS

| | |
|---|---|
| CONTACT RATINGS | 20, 30, 40 amp continuous duty.<br>Contacts replaceable. |
| CONTACT TERMINALS | Pressure connections on all models. |
| COIL TERMINALS | Screw type, quick connect type or leads.<br>Coils can be easily changed. |
| COIL RATINGS | 6 to 550 Volts A.C. |
| POLE ARRANGEMENT | 2 - 3 - 4 pole normally open.<br>(Normally closed available on request.) |
| ENCLOSURES | Open type and Nema 1. |

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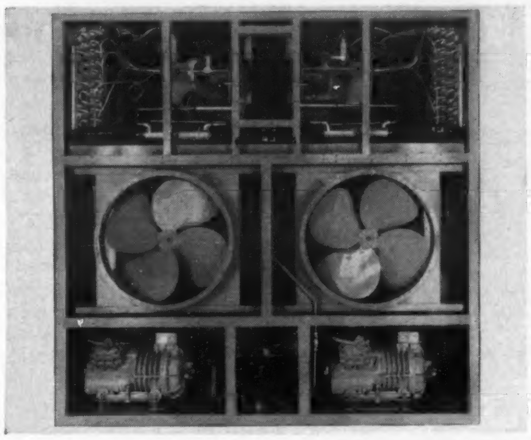
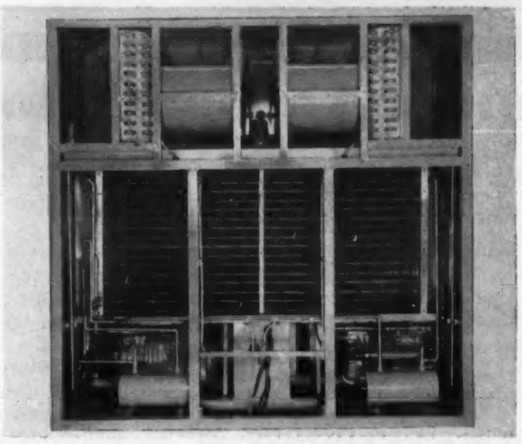
ON DISPLAY IN BOOTH 620





**LEFT:** OUTSIDE VIEW of the rugged unit, which has two independent refrigeration systems hooked to the same control system.

**RIGHT:** INSIDE VIEW of two-stage unit which is claimed to be only one of 90 vans to give trouble-free operation during Eniwetok atom bomb test.

switch or the second stage of heat.

Should the space temperature continue to rise, the modulating motor will continue to move and the first stage of heat will be de-energized. At this point, heating and cooling are both inoperative and the thermostat should be satisfied.

However, should the space temperature continue to rise, the third cam will energize the third micro-switch opening a solenoid valve which allows liquid refrigerant to pass into the cooling coil.

### Pumpdown Cycle Provided

Under low ambient temperatures, suction pressure. with the solenoid valve energized, will not reach the cut-in setting of the low pressure cut-out. The low pressure cut-out provides a pumpdown cycle for the compressor. A relay provides a bypass circuit across the low pressure cut-out and allows the compressor to start.

After the compressor is in operation, suction pressure increases and allows the pressure cut-out to close. The relay operates simultaneously with the solenoid valve.

As either stage of cooling continues to operate, the condensing pressure will start to rise. As it rises to the setting of the first stage fan control, the first stage condenser fan will be energized.

A further rise in condensing temperature on either compressor will operate pressure switches causing the second stage compressor fan to operate.

Two pressure controls, located in the compressor compartment, operate the condenser fans through contactors to maintain proper compressor discharge pressure throughout the ambient temperature range requiring compressor operation.

Should the temperature in the space continue to rise, the program controller will energize the second stage of cooling. The second stage operates exactly as the first stage. However, it is provided with a time delay relay to prevent both stages from starting at the same time.

At this point, both stages of cooling are in operation. Should space temperature begin to fall, the cam of the program controller will break the circuit through a micro-switch and cause the solenoid valve in the second stage system to be de-energized, stopping the flow of refrigerant to the cooling coils. The relay also opens, thus breaking the low pressure cut-out by-pass.

Since the compressor is still operating, the suction pressure will fall until the lower setting of low pressure cut-out is reached. At this time this switch breaks the holding coil circuit of the second stage compressor and it stops.

As space temperature continues to fall, first stage of cooling will pump down and stop. After the compressors stop, the condensing pressure should drop.

When pressure drops below the settings of the high pressure switch, the second stage condenser fan will be de-energized. A further drop in discharge pressure will cause the first stage condenser fan to be de-energized. On cool days it is possible that each fan is intermittently operated.

A further decrease in space temperature will call for one or two stages of heat as required.

Rouse pointed out that the compressors work on what is called a pump-down cycle where they are started by the relay and stopped by the low pressure cut-out.

This is done, he explained, to protect the compressor against liquid refrigerant accumulating in the crankcase or cylinders due to leaking valves or low ambient temperatures.

Rouse said the unit will sell for approximately $8,000.

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"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.
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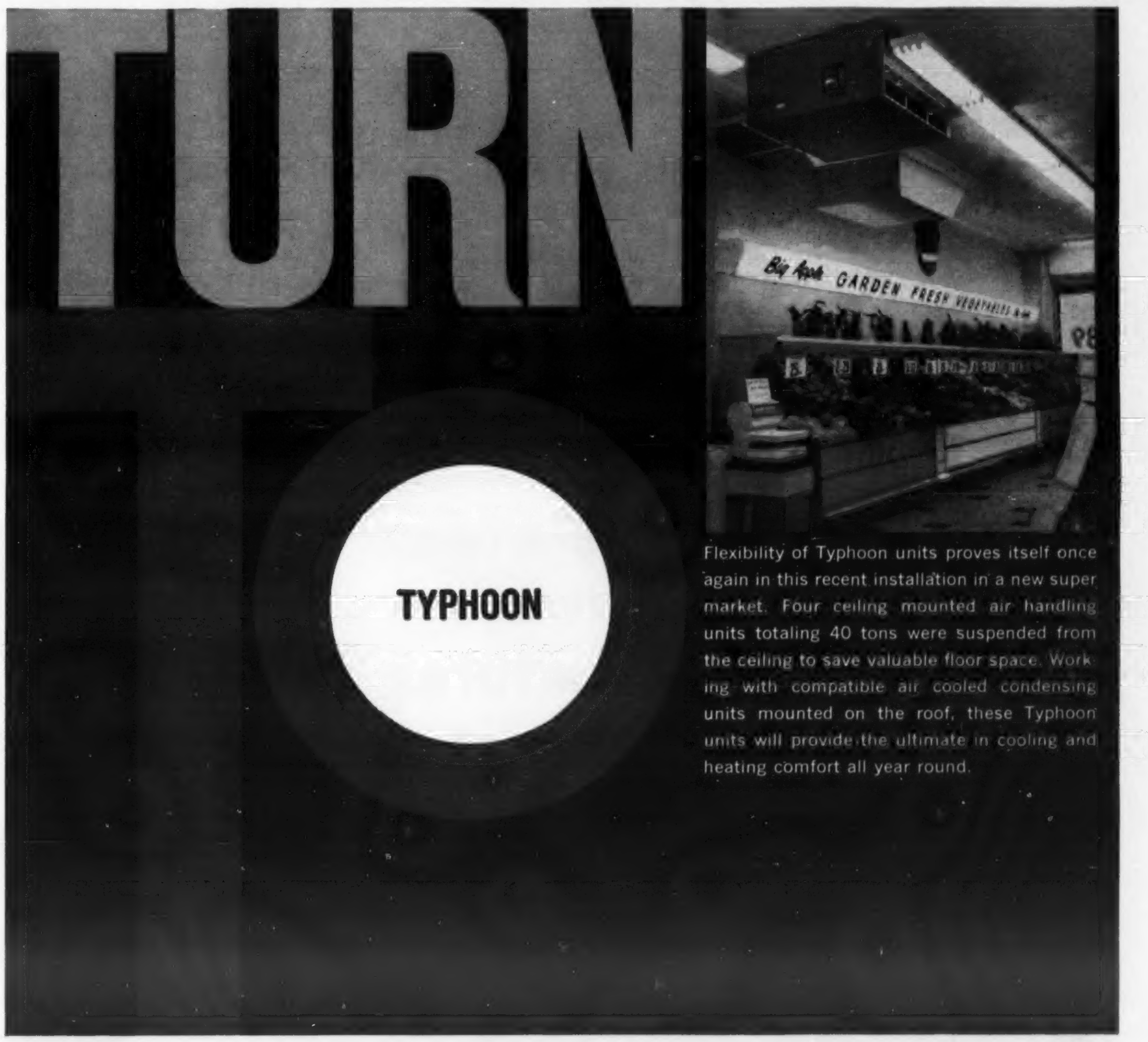

Flexibility of Typhoon units proves itself once again in this recent installation in a new super market. Four ceiling mounted air handling units totaling 40 tons were suspended from the ceiling to save valuable floor space. Working with compatible air cooled condensing units mounted on the roof, these Typhoon units will provide the ultimate in cooling and heating comfort all year round.

**AND HAVE THE RIGHT EQUIPMENT, AT THE RIGHT PRICE, EVERY TIME!**

Now you can fill every need, solve any problem with Typhoon's exclusive residential, commercial and industrial equipment! A full range of air cooled units from 2 tons to 20 tons, both packaged and as split systems. Water cooled units from 3 tons to 75 tons. Remote air cooled condensing units to 20 tons, water cooled to 75 tons. Gas and oil fired furnaces in horizontal, vertical upflow and counterflow types. And now, Typhoon's line of compact air-to-air heat pumps will open a new era in air conditioning for you. Each and every unit with built-in Power Reserve—a combination of superior components and oversize parts that insures dependable performance above rated capacity through all weather extremes. All copper condensers in water cooled units, largest coil surfaces and rugged 11 and 14 gauge metal cabinets. Find out how Typhoon quality and flexibility can add to your reputation for getting the job done better, faster, more economically—with more profit for you.

TYPHOON
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Typhoon Air Conditioning Company, Division of Hupp Corporation
505 Carroll Street, Brooklyn 15, New York

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☐ Please send full product literature.

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Firm____________________

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9A-1

# Air Distribution Requirements In Year-Round Air Conditioning

## Part 3—Fundamentals of Equipment

*By Frank D. Klein, Chief Engineer, Governair Corp.*

The water-cooled shell-and-tube condenser acts in two capacities in a system. Up to a certain point (a) as the condensing mechanism and (b) as a receiver. The refrigerant, after condensing in the upper half of the shell, turns into liquid, thus dropping to the bottom. Usually, as a result, the lower portion of the condenser functions as a receiver as well.

From a discussion and description of the shell-and-tube condenser we pass on to other types of condensers, for, after discussion of all popular types, a general discussion will be presented on the application of the basic heat transfer principles that bring about the calculations for capacity in all.

### THE EVAPORATIVE CONDENSER

Fig. 55 illustrates two types of Evaporative Condensers. "A" illustrates the "pull through" type while "B" illustrates the "blow-through" type.

The operating principle of these type condensers is shown in each illustration. Refrigerant discharged from the compressor is passed into a serpentined coil, over which cooled water is sprayed and at the same time air of the required volume and velocity is drawn over the condensing coil.

Heat is transferred through the tubes of the condensing coil to both the air and water combined as the transfer medium; the water falls to the make-up pan, the induced air is discharged into space and the condensed refrigerant passes from the condensing coil into a receiver.

Evaporative Condensers are predicated on the fact that *evaporation* is accompanied by a cooling effect, which is brought about through the evacuation of the latent heat of vaporization. For instance as a simple explanation, and without other complicating factors, through the evaporation of 1 lb. of water (8.33 lbs. per gal.) 1,000 B.t.u. is removed from the surrounding air and the water itself that remains.

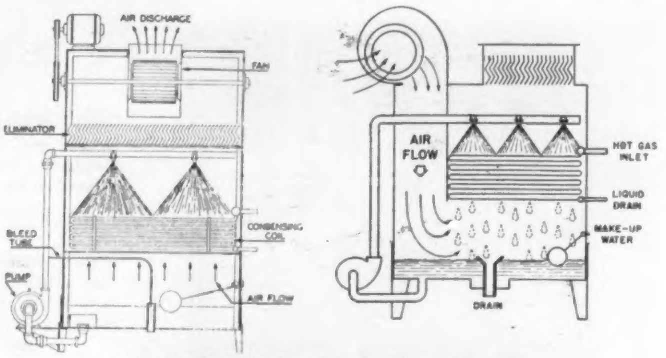

FIG. 55—Typical types of evaporative condensers.

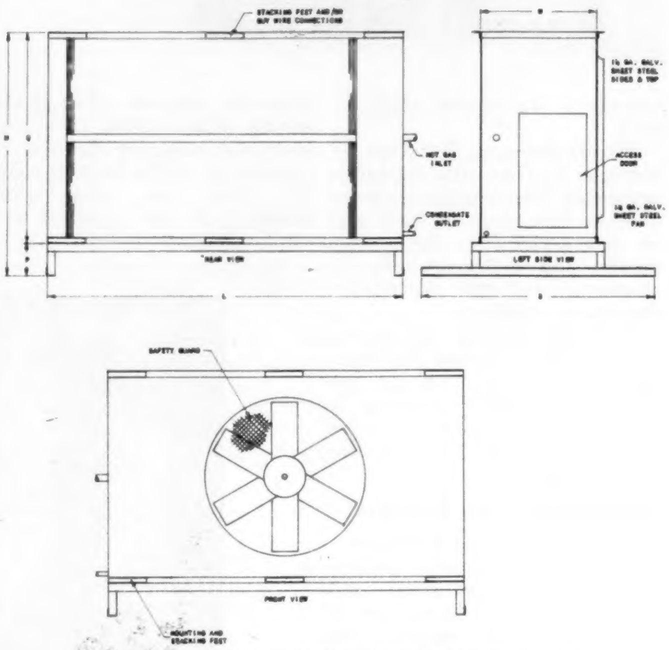

FIG. 56—Typical remote-type air-cooled condenser.

Evaporation of water of course cannot be accomplished without heat. As a result 1 lb. of water on evaporation is equivalent to the cooling effect of 12 gals. of water (100 lbs.) through a temperature rise of 10° F. It is because of the tremendous cooling effect in evaporation that Evaporative Condensers justify their operation and application.

### THE AIR-COOLED CONDENSER

Many think that the Air-Cooled Condenser is a product of the most recent years, when as a matter of fact air-cooled condensing in fractional tonnage compressors has been done for a great many years in domestic refrigerators and commercial refrigeration equipment, etc. However, in the instance of this discussion reference is made only to the Remote Air-Cooled Condenser types normally applicable to and used in normal

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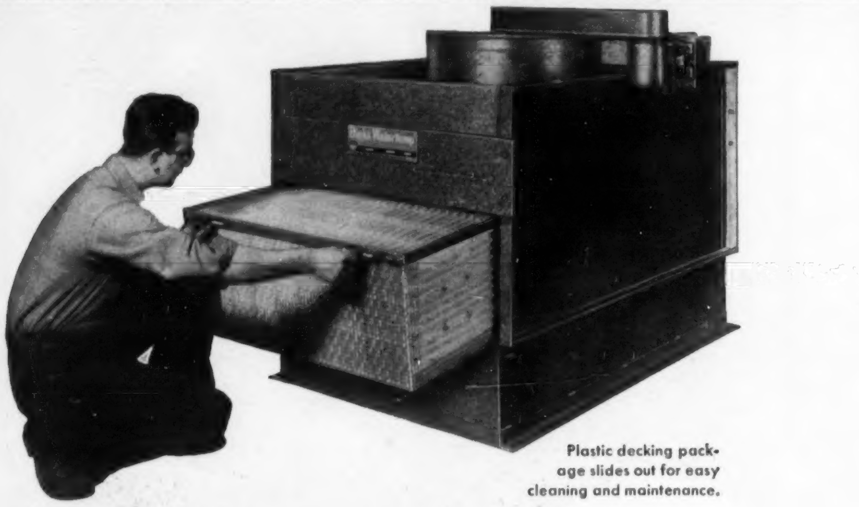

Plastic decking package slides out for easy cleaning and maintenance.

Binks new Watertemp cooling tower gives you advanced tower features at low installed cost

Binks WATERTEMP cooling tower packs high cooling efficiency into a package that makes sense in original installed cost and long-haul maintenance.

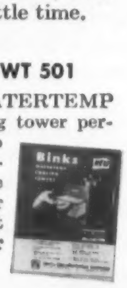
**Fast, simple assembly**
You need only a simple mounting foundation. Sub-assemblies need only a wrench . . . work goes fast.

**Needs no paint**
The only weatherproofing coating needed is already on the tower when shipped. All parts have been hot-dip galvanized after fabrication. A special galvanizing process deposits a thicker coating than established as standard by Federal and A.S.T.M. specifications.

**Easy to maintain**
There are no spray nozzles to clean. The plastic decking is practically indestructible . . . and the decking package slides completely out of the tower. Decking clean-up is easy and the whole tower interior is exposed for maintenance.

**Economical 3 ways**
Original price is low. Easy installation holds costs down, too. Maintenance takes little time.

**Send for free Bulletin WT 501**
See how the many WATERTEMP features let you bid big tower performance and still keep your quote down. Bulletin contains complete specifications. Get your copy from your nearest Binks Branch Office or write direct.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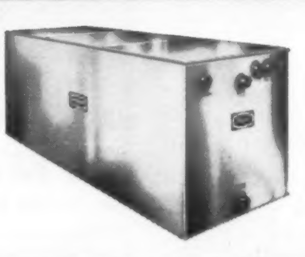
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DEPENDABLE AIR CONDITIONING

Maximum Refrigeration Efficiency DOLE THE Cel LINE

## Air Distribution--

*(Concluded from preceding page)*

temperature air conditioning systems. Modern Air-Cooled Condensers are found on applications from small ½ ton room window air conditioners through 100 tons mounted in segments on roofs and other locations where free access to atmospheric air is possible.

Fig. 56 shows a typical Air-Cooled Condenser for remote installation. This type is manufactured in sizes ranging from 10 tons through 25 tons; larger tonnages are accomplished by field coupling various tonnage segments.

### Air-Cooled Condensing Coil Installed Vertically

The air-cooled condensing coil as shown in Fig. 56 is installed in the cabinet vertically whereby air drawn by the propeller fan may pass over it counterflow to the flow of discharged refrigerant in the coil. The coils are copper tube — aluminum fin; tubing is ⅝ in. o.d., fins are set eight to the inch, and the depths of rows stay consistently at four with variations in face area accommodating variation in capacity with variation in air flow.

Under normal atmospheric ambient conditions Air-Cooled Condensers are designed on the basis of a 20° differential between condensing temperature and air entering the condensing coil. 40° ST (suction temperature) is basic for design which dictates a rejection of 14,400 B.t.u./ton of net refrigeration effect or evaporator capacity.

Also basically, air quantities to be moved over the condensing coil vary between manufacturers from 950 c.f.m. per ton to 1,200 c.f.m. per ton. Good design demands a minimum of 1,050 with 1,200 preferred.

### Air-Cooled Condensers Best For Year-Round Use

Because no water is involved in the condensing operation such as that with the Evaporative Condensers, Air-Cooled Condensers in some instances are more applicable to year-round operation. However, low ambients in winter cycle must be compensated for much in the same way that low water temperatures must be, in shell and tube as well as evaporative condenser types.

As the ambient is lowered compressor head pressures fall off. If they fall off too low then, of course, the compressor cuts off on low head pressure. In Air-Cooled Condensers this is compensated for by having a "Low Head" control switch which stops the fan when temperatures of the air entering the coil fall below the selected point.

With this preliminary discussion completed on these three types of condensers most commonly used, the following instalments on heat transfer information and selection data is important when considering the operation and effect of the condensing cycle of a system employing any one of the three.

At this point, however, only the primary thermal transfer information will be discussed as applicable to both investigation and selection.

*(To Be Continued)*

## 2 Large Heat Pump Installations Located In Pennsylvania Point Up Favorable Economics

YORK, Pa. — Favorable economics of two large heat pump installations in the Philadelphia area were pointed up here recently by Arnold D. Spillman, manager of the sales application department for the Philadelphia Electric Co.

Speaker at the first customer forum held by York Div. of Borg-Warner Corp., Spillman cited power cost experience at the Levittown Shopping Center, which uses small package heat pumps totalling 432 tons of refrigeration, and the Ballinger Co., where a two-stage heat pump provides heating and cooling.

At Levittown, Spillman told 75 York student engineers and key personnel, operation cost comparisons showed that heat pumps compared favorably with oil heat in the area as long as the price of oil averaged about 13.5 cents per gallon.

The heat pumps in this installation use resistance heating for auxiliary heat during low winter temperatures. These auxiliary heaters come on during the coldest periods when the power company's demand is at its highest peak.

Spillman pointed out that this was not a desirable situation for a power company and therefore a two-stage heat pump such as York installed at the Ballinger Co. in Philadelphia is ideal.

Data gathered at the Ballinger Co. over the past two years by Philadelphia Electric has proven that a night set-back (from 72 to 65°) was not financially advantageous.

Using night set-back, the yearly bill for total electrical usage was approximately $1,700. During January and February, the demand went to 175 kw. in the morning when the equipment was operated at full capacity to overcome the set-back.

The next year, without set-back and an increased number of degree-days resulting from more severe weather, the total bill stayed around $1,700 and the demand stayed below 145 kw.

Spillman said that if gas or oil had been used for heating, the yearly bill would have been approximately $2,100.

In addition, using a two-stage heat pump resulted in a 5% savings in fire insurance rates over conventional methods of heating.

The speaker, who is also chairman of the sales methods and development committee of Edison Electric Institute, emphasized that York and other sales engineers have ready assistance available from local utilities such as Philadelphia Electric, which sells electricity, gas, and steam service.

As an example, he showed a brochure outlining the company's promotional plans for 1959 which placed strong emphasis on the heat pump.

York's January customer forum will be devoted to the customer's viewpoint in air conditioning large office buildings. February will cover the relationship between the manufacturer of air conditioning, heating, and refrigeration equipment and the consulting engineer.

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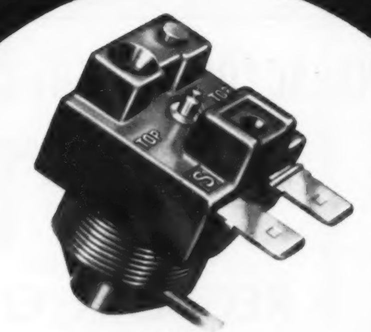

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# The Consulting Engineer's Column

Aim of this column is to present information of particular and current interest to Consulting Engineers, and those active in application engineering work generally. The editors invite contributions to the column from all who are engaged in such activity.

## Designing Church Air Conditioning

*By A. L. Munson, A. L. Munson & Associates, Consulting Engineers, St. Louis, Mo.*

Churches always present special problems to the engineer when he is called upon to design an air conditioning system.

Neither the architect nor the church group will tolerate anything which might detract from the beauty of the church, or the simplicity and symmetry of its lines.

But in order to provide good air conditioning, it is essential that the conditioned air be brought to and directed into the area that is to be air conditioned.

This usually means that ductwork must be used for carrying the air to the point of use. And ductwork is not the most attractive metal work in the world.

So the ductwork must be hidden somehow, somewhere.

The designer is fortunate if there is an available attic space, or if the ductwork can be furred-in somehow.

But construction is now starting on a new church, going into St. Anne, Mo., which had no attic space, and which was of a severely simple masonry construction with a ceiling height of about 25 ft. There was just no place to run the supply air duct risers from the basement equipment room to the furred-in ceiling supply ducts.

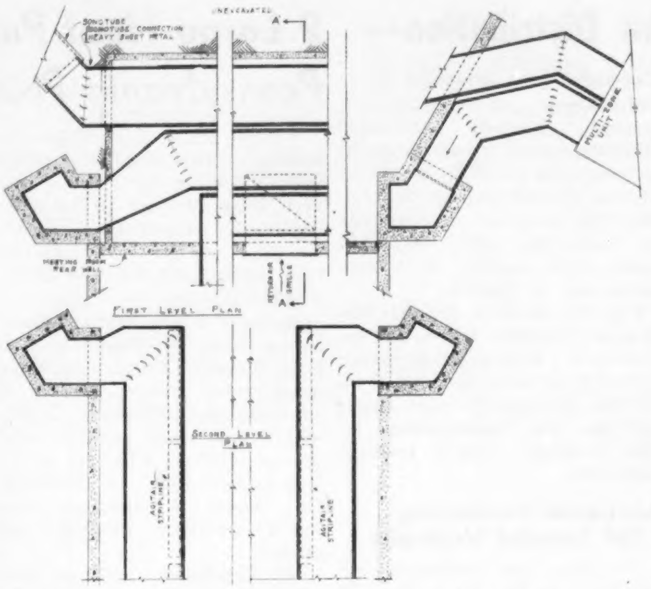
Any risers run within the building would have destroyed the beauty and simplicity of the church interior. And any risers run outside of the building would have been an insulated eye-sore.

The only thing left to do was to run the risers up inside the walls of the building. But the walls were only 12-in. thick masonry, and about 20,000 c.f.m. of supply air had to be brought up to the two along the wall ceiling supply air ducts.

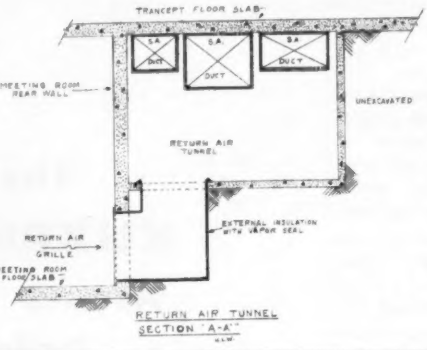
J. T. Golabowski, the architect, was very cooperative. All the possible arrangements were sketched out with him, and then promptly discarded, until only the masonry columns remained as a possibility. Could the masonry columns be made large enough to provide sufficient free area in the middle of the column?

They could. And they were. And they would be lined with ½-in. glazed Fiberglas insulation—against sweating, and to subdue noise.

The illustrative sketches show what happened. It makes a very feasible and economical arrangement.


SONOTUBE
SONOTUBE CONNECTION
HEAVY SHEET METAL
UNEXCAVATED
A'
MULTI-ZONE UNIT
MEETING ROOM REAR WALL
RETURN AIR
GRILLE
A
FIRST LEVEL PLAN
SECOND LEVEL PLAN
AGITAIR STRIPLINE
AGITAIR STRIPLINE

DETAILS of air distribution system for a church, in which masonry columns were used as supply air risers from the basement equipment room to the ceiling supply ducts.


TRANCEPT FLOOR SLAB
S.A.
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DUCT
MEETING ROOM REAR WALL
UNEXCAVATED
RETURN AIR TUNNEL
EXTERNAL INSULATION WITH VAPOR SEAL
RETURN AIR
GRILLE
MEETING ROOM FLOOR SLAB
RETURN AIR TUNNEL
SECTION "A-A"

LARGE concrete tunnel is used for gathering the return air. This tunnel leads into the equipment room, where a sheet metal return air duct makes the final connection to the air handling unit.

A 6-zone multi-zone Carrier air handling unit was located in the basement equipment room. A multi-zone unit was selected since the church had so many varied exposures, and also to take care of the relatively small sacristy area—whether the balance of the church was in use or not. This space would otherwise be too hot or too cold, since it is such a small part of the entire load.

A 75-hp. direct expansion Refrigerant-12 water-cooled com-

*(Concluded on next page)*

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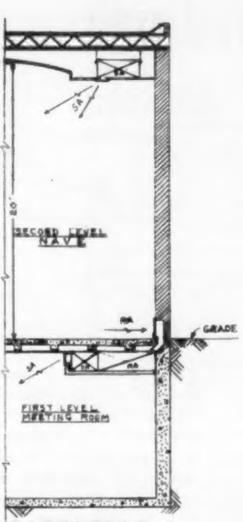

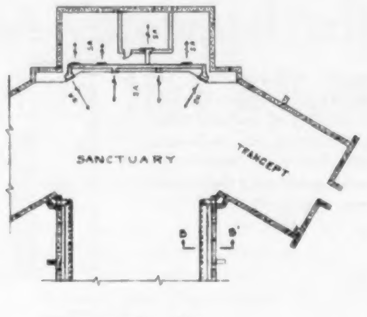

(Above) Plan for the second level, showing the manner in which the supply air is distributed into the main area. (Left) "Section" elevation sketch showing arrangement of supply air ducts for meeting room, and return air ducts from the second level.

## Church Cooling--

*(Concluded from preceding page)*

pressor was located alongside the air handling unit, with a cooling tower out on the low back roof above the Sacristy where it would be most inconspicuous.

Johnson Service controls were used since the pneumatic control could properly average the zone temperature requirements through an averaging relay, to cut out half the DX coil when the load became less than 50%, and thus keep the compressor-coil balance while providing the cooling that might be required.

A large concrete tunnel was used for gathering the return air. This tunnel led right into the equipment room, where a sheet metal return air duct made the final connection to the air handling unit.

All the supply air ducts going in that direction were run inside this return air tunnel for economy of space and insulation. Sonoair ducts were used in some places for both supply air and return air take-offs from this tunnel, with the supply ducts being insulated with a zonolite insulating concrete.

There was only one other room in the basement. And that was a meeting room which had to be air conditioned also (another reason for using the multi-zone unit). It was decided to use side wall type double deflection grilles from a furred-in supply duct in the corner of the ceiling and each side wall.

However, return air had to be taken at the floor of the main church Nave, so space had to be provided between this supply air duct and the outside walls, for return air ducts from the Nave. However, both ducts were furred-in together for a pleasing appearance. The "section" elevation sketch will show the arrangement described.

The cost per ton for this installation, including the steam boiler, and all accessories, was just under $600 per ton, which is unusually low for this type of work.

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Mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

## *JAC Adopts Methods To Strengthen Apprentice Program*

SAN FRANCISCO—Methods which could be used to strengthen any apprentice program have been adopted by the plumbers joint apprenticeship committee.

Invitations are being sent each month to two employers, and two from labor actually working with apprentices, to attend the JAC meeting.

For the first time, at the end of each semester, employers will be given the school rating of their apprentices and the recommendations of the committee.

Purpose is to build a strong liaison with the trade, increase interest in on-the-job training, give full knowledge of the improved course of study used.

## Revised 'American Standard Safety Code For Mechanical Refrigeration' Available

NEW YORK CITY—A revision of the American Standard Safety Code for Mechanical Refrigeration (ASA B9.1-1958) is now available at $1 per copy from the American Standards Association, Dept. PR 30, 70 E. 45 St., New York 17, N. Y.

The changes incorporated in the 1958 revision concern a number of technical details which keep the code abreast of technical developments in the field of refrigeration, it was noted. For the first time, occupancy classification for use of the code includes single family private residences.

Sponsored by The American Society of Refrigerating Engineers, the code is intended to provide standards of safety which can be readily adopted by any organization using mechanical refrigerating equipment or by any regulatory authority concerned with safety regulations.

The code covers the safe design, construction, installation, operation, and inspection of every refrigerating system employing a fluid which is vaporized and normally liquified in its refrigerating cycle.

Provisions of the code do not apply to the use of water or air as a refrigerant nor to refrigeration systems installed on railroad cars, motor vehicles, motor drawn vehicles, or on shipboard.

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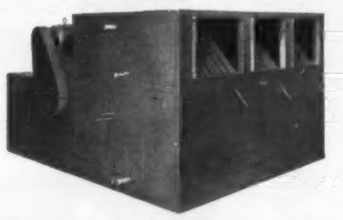
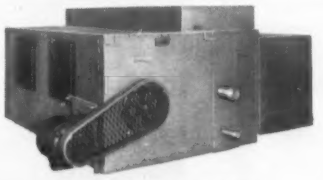


**MULTIZONE AIR CONDITIONING UNITS**

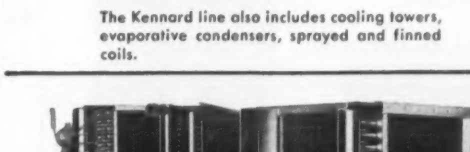
A single central station Kennard Multizone Unit can efficiently condition multiple zones. Cooling coils: direct expansion and chilled water. Heating Coils: steam or hot water.



**AIR HANDLING UNITS**

14 sizes of horizontal and vertical air conditioning units with CFM ranging from 400-36,000 CFM. Heating and ventilating units with 400-36,000 CFM capacities for steam or hot water systems.

The Kennard line also includes cooling towers, evaporative condensers, sprayed and finned coils.



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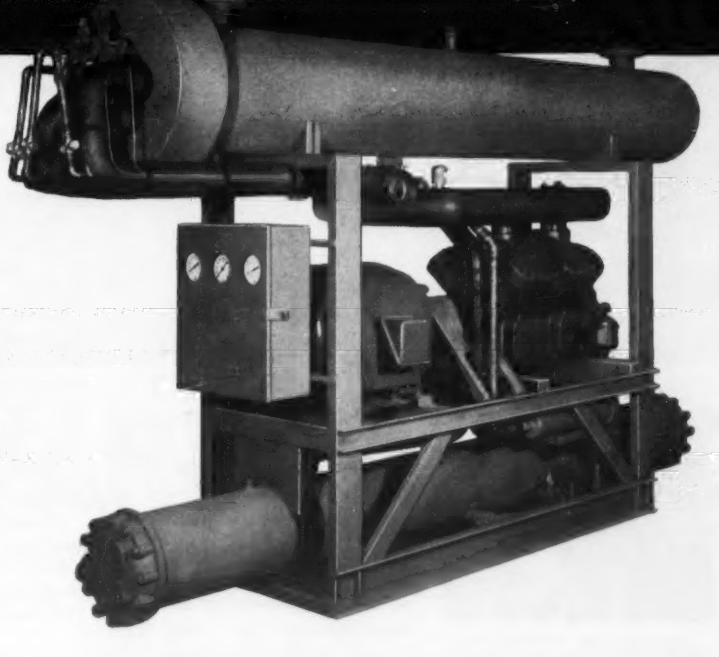

Kennard's shell-and-coil chiller (the heart of the package) puts this Packaged Liquid Chiller in a class by itself in the 20 HP-150 HP range.

Exclusive internally-finned tubing, *built as an integral part of each tube,* overcomes costly heat transfer problems on the refrigerant side.

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This outstanding package requires no field assembly. After simple electrical and water connections the Kennard Packaged Liquid Chiller is ready to operate. Special built-in safety devices protect the chiller and compressor under all operating conditions.

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# 'Sound Control' For Smaller Cooling Jobs Can Be Developed with Contractor Ingenuity

DAYTON—"Sound control" is often a very important factor in promoting customer satisfaction in air conditioning systems. In larger installations special sound deadening and sound-baffling accessories are often used. In smaller installations the contractor may often find it necessary to devise some "on the spot" methods of sound control.

One distributor who has developed his own methods of handling sound control problems is L. O. Warner, Dayton air conditioning and refrigeration contractor.

One type of problem which he encountered involved the outdoor installation of an air-cooled condensing unit assembly. The unit was located in the "V" between two brick walls running at right angles with one another. This seemed to reverberate and intensify the sound made by the unit.

First step he took was to insulate the outside cabinet of the unit with Pittsburgh Plate Glass acoustical duct lining. He also insulated the fan housing.

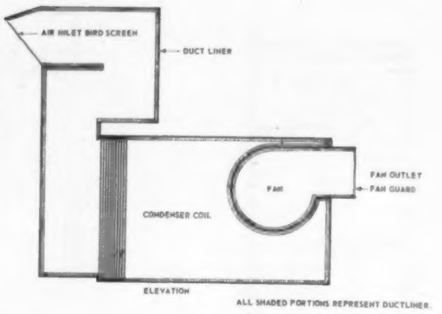
As a further measure, Warner constructed a "sound box" of his own design to be placed at the condenser air inlet.

This was made with exterior galvanized iron, and lined with the above-mentioned type of acoustical duct lining material. As shown in the illustration the sound box is in the form of something of a maze-type baffle, so that the noise created by condensing unit is successfully subdued.

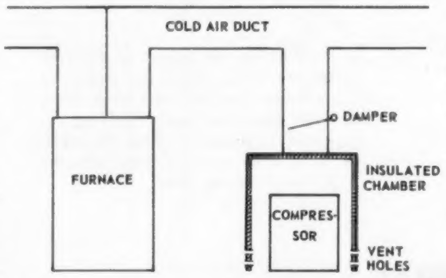
Another type of sound problem involved the reduction of noise level created by a remote type installation of a condensing unit in an occupied space (such as a retail showroom).

In this instance, Warner built an enclosure for the condensing unit of plywood and lined it with acoustical duct liner. He cut holes in the bottom of the box to provide air circulation, and for further cooling of the compressor body, he brought air from the main cooled air duct riser through a small pipe directly into the enclosure.

A damper in this pipe provided a means of controlling temperature by varying the amount of air supplied to the enclosure.



(Right) Sound-proofing for an outdoor installation of a condensing unit was done by building a sound-box with acoustical duct liner, and constructing a maze-type sound baffle for the inlet air.



(Left) To handle a sound problem arising from the "inside" installation of a package unit or compressor, a sound chamber is built around the equipment, and in this particular instance air for compressor body cooling is brought from the main air duct riser.

## Mark Mooney Sets Up New Heat Pump Outlet

TAMPA, Fla.—Air Conditioning Equipment Distributors, Inc. has been formed to distribute packaged air conditioning equipment and heat pumps to dealers in the Florida west coast area, it was announced by Mark E. Mooney, president of the new company.

The company will handle equipment made by Typhoon Air Conditioning Co., Brooklyn, and Typhoon Heat Pump Co., Tampa. Both Typhoon companies are divisions of Hupp Corp.

According to Mooney, the new distributing firm was formed to serve the growing network of Typhoon dealers in the area. As a distributor the firm will stock Typhoon units, facilitating delivery to dealers, and coordinate area-wide promotion of the sale and leasing (through a capital-conservation leasing plan recently announced by Typhoon) of year-round conditioning equipment.

Other officers of the new company are Sam F. Graziano, secretary, and Leo M. Toribio, treasurer. The firm is located at 116 East Buffalo Ave., Tampa.

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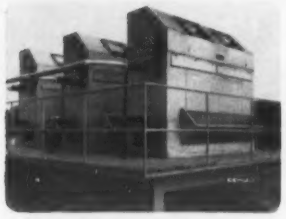

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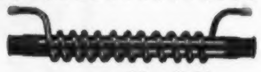

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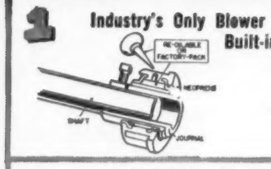

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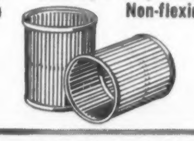

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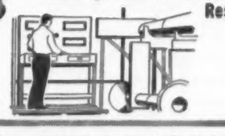

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# Air Distribution Combined with Acoustical Tile Ceiling Which Has Adjustable Slots

EL PASO, Texas—Construction is under way on the new El Paso University Towers building which will be air conditioned by what is termed a unique system.

Located on North Oregon St., the building will be six stories high with a pharmacy and other commercial establishments located on the first floor, while the upper five floors will be designed for medical suites.

Besides being one of the latest architectural designs in medical buildings, the structure will have one of the most modern air conditioning systems in the El Paso area, it was reported.

A unique system has been designed combining the air distribution with the acoustical tile ceiling, according to York Corp.

"The acoustical tile contains small slots through which the air passes under pressure," it was explained. "The slots are adjustable and can be regulated to suit the tenant. They are 3/16 in. wide by ¾ in. long, or about one-quarter of 1% of the original open area.

"While no air velocity is felt 2 ft. from the ceiling, enough kinetic energy is produced to start the air in a circular motion creating aspiration without appreciable turbulence.

"The air pressure created by the air conditioner fan in the plenum above the ceiling forces the air through the slots at a uniform velocity and prevents dirt and smoke from traveling upward and discoloring the ceiling.

"This type of design also makes possible the moving of partitions within the medical suite without changing any of the air distribution or necessitating any expensive duct changes.

## Each Suite To Have Own Thermostat

"Each medical suite will have its own individual temperature control by means of a thermostat located on the wall. The air is filtered, cooled or heated, as the occasion demands, and dehumidified if required at the York air conditioning units located on every other floor.

"Thirty per cent of the air circulated is made up continuously with fresh air from the outside and conditioned in the air conditioners before being circulated to the conditioned spaces.

## Quietness Emphasized

"The acoustical tile on all the ceilings is not the only consideration given for extreme quietness. The air conditioners have been selected with low tip speed supply fans and the duct velocities in the dual duct system supplying the air plenums are extremely low.

"The refrigeration unit itself is about as quiet as present engineering design can make it. It is a 169-ton York absorption unit that has only two circulating pumps as moving parts. The unit is completely automatic.

"The absorption unit will be located on the roof of the building along with the low pressure steam boiler and induced draft cooling tower. Besides its quietness, the absorption unit is very economical in operation in this area because of the low cost of natural gas."

The air conditioning units and the absorption unit are being furnished by York Corp., subsidiary of Borg-Warner Corp.

Garland & Hillis of El Paso, Texas, is the architect, and John Freeman of Los Angeles is the consulting engineer of this ultra modern structure. The general contractor is Morley Construction Co. of Los Angeles.

The special acoustical tile is to be furnished by Southwest Acoustics Co., El Paso, local representative of U. S. Gypsum Co.

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Air Conditioning, Heating & Refrigeration News

# *Lau Expands Custom Design Service To Include Small Blower Wheels*

DAYTON — Air conditioning and warm air heating furnace manufacturers will now have greater assistance in securing specialized blowers for their products due to an expanded custom design blower service announced by The Lau Blower Co.

W. W. Morrisey, Lau's blower sales manager, explained the increased service will be devoted primarily to the design and production of small blower wheels ranging from 4¼ to 9 in. in diameter, for blower motor assemblies using these wheels.

"With the trend toward more compact wall and space heaters plus the constant decrease in the size of room air conditioners, we are expanding our custom service to better serve makers of these units," he said. "In past years this custom service has been limited to blower wheels of 9-in. diameter and larger. This service will still exist but we will also emphasize the smaller wheels."

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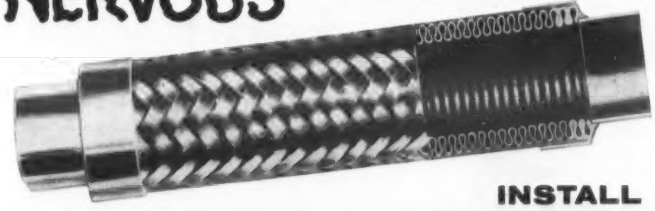

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Flexonics Research Laboratories, Elgin, Illinois
In Canada: Flexonics Corporation of Canada, Limited, Brampton, Ontario

(10 ton AIRVEC installation on roof of Daylight Grocery, Jacksonville, Fla.)

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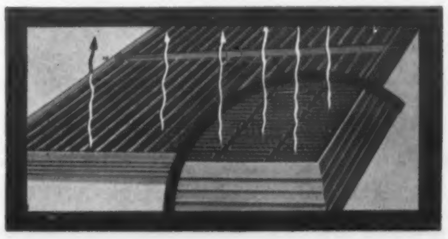

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*In Average Home*

# Southern California Study Sets Operating Cost of Heat Pump at $13 Per Month

LOS ANGELES — On the basis of operating cost studies which it has been conducting for some time, Southern California Edison Co. reports that it costs from ½ to ¾ cents per sq. ft. of living area a month to warm and cool an average house with an electric heat pump.

This means, says the utility, that a home with three bedrooms, living room, dining area, kitchen, and two baths can be heated and cooled for approximately $13 per month.

In sample areas throughout southern California, Edison is finding that approximate heat pump costs for homes of 1,000 sq. ft. ranged from $5 to $7.50 per month; homes of 1,250 sq. ft. averaged from $6.25 to $9.50 per month; 1,500-sq. ft. homes, $7.50 to $11; 1,750-sq. ft. homes, $8.75 to $13; and 2,000-sq. ft. homes, $10 to $15 per month.

Generally, the studies indicate that the cost of operating a dual-purpose heat pump is about the same as that of an ordinary heating system plus a cooling system, says Southern California Edison.

**For Your Reprint Copy**

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich. Only 25¢ each.

**FIRST MEETING** of the Joint Merger Study Committee of the Mechanical Contractors Association of America and the National Association of Plumbing Contractors was held in Chicago's Palmer House on Nov. 14. In foreground, left to right: John N. Scanlon, New York City (MCAA); Philip Hering, Jr., Philadelphia Co-Chairman (NAPC); Joseph H. Spitzley, Detroit, Co-Chairman (MCAA); and S. Austin Pope, Chicago, (MCAA). Back row: Thomas L. Egan, Washington, D. C. (MCAA); Jerome O. Hendrickson, Washington, D. C., Co-Secretary (NAPC); G. Allen Briggs, Oak Park, Mich. (NAPC); Wilbur S. Hokom, Beverly Hills, Calif. (NAPC); H. Merwin Porter, Minneapolis, (NAPC); Walter E. Eynon, Canton, Ohio (NAPC); Lloyd B. Gruman, Jr., New York City, Co-Secretary (MCAA); and Wray M. Scott, Omaha, Neb. (MCAA).

# NAPC-MCAA Committee Holds Second Meeting

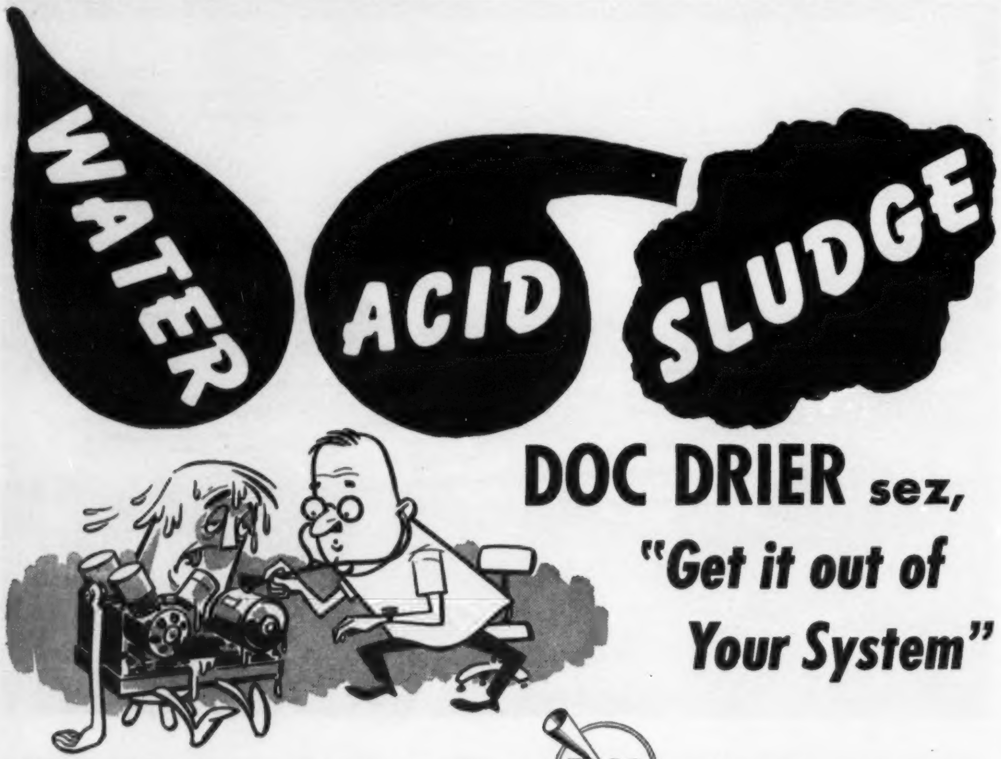
WASHINGTON, D. C. — The second joint meeting of the committees of the Mechanical Contractors Association of America and the National Association of Plumbing Contractors studying a proposed merger met at the Mayflower hotel here.

The joint committee reviewed and discussed the following 13 major subjects.

Name; purposes and objects; membership qualifications; method of voting; election of officers and board of directors; dues structure; conventions; standing committees; association managers' and secretaries' conference; amending the bylaws; bylaws only vs. constitution and bylaws; legal phases in merger; publications.

The committee explored in detail the many problems involved and believes that ways and means are available for dealing with four of the above subjects which were discussed, namely: membership qualifications; dues structure; method of voting; election of officers and directors both on interim and permanent basis.

The committee plans to review and amplify the above four subjects as well as to consider the balance of subjects in the 13-point agenda at its next meeting in Chicago in early February.



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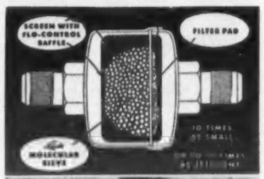

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Photograph at right shows that the 1 Ton size is smaller than a golf ball—the 15 Ton size is as small as a baseball. Save space in your system, your stock room, your service trucks, and save money with TMC low prices.

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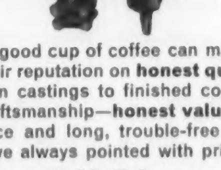

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*We, at Hubbell, have never and will never compromise honest quality for price.*

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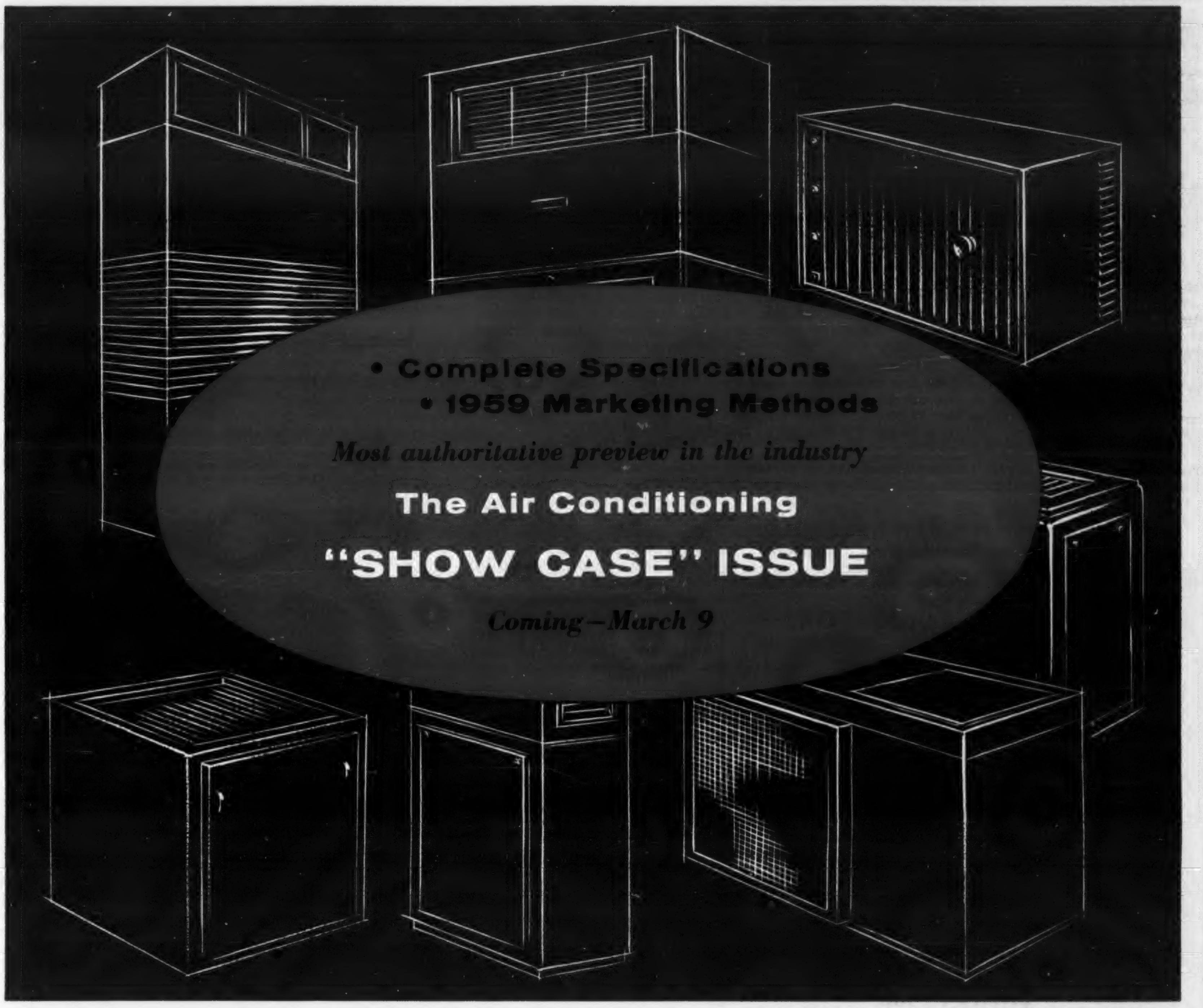

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# 2 Furnaces 'for Price of 1' Provide Needed Zone Control, Possibly Industry Upgrading

NEW YORK CITY—"Two for the price of one."

That's a fundamental sales approach which appeals to every bargain-conscious consumer, and if it can be demonstrated also that the "two" give much better results and satisfaction than just "one," then sales ought to boom.

This is the hope, at least, of American-Standard's Air Conditioning Div., which has been engaged for some months now in a nationwide promotional effort to sell builders on the idea of providing "balanced heat" in their larger homes by using two furnaces for zone control.

At first glance the "two-for-one" price angle might appear a further demoralizing step for the harassed furnace industry which in recent years has found it increasingly difficult even to sell *one* furnace for the price of one, thanks to cut-throat competition.

Actually, though, the American-Standard approach could have an upgrading influence, especially if other manufacturers start encouraging the idea (which American - Standard hopes they will).

Reason is that the program calls for two smaller furnaces instead of one large furnace—two 75,000 B.t.u. models instead of a single 150,000 B.t.u. furnace, for example.

Because of the economics of greater mass production, two of the popular smaller furnaces generally cost little if any more than one of twice their capacity, it is explained. Thus, this approach involves no price-cutting. In fact, over-all installation costs of two small furnaces independently controlled for zoning can run a little more than a single large furnace, but this does not nullify the economy story for the consumer because of the savings in operating and maintenance costs possible with two furnaces, according to American-Standard.

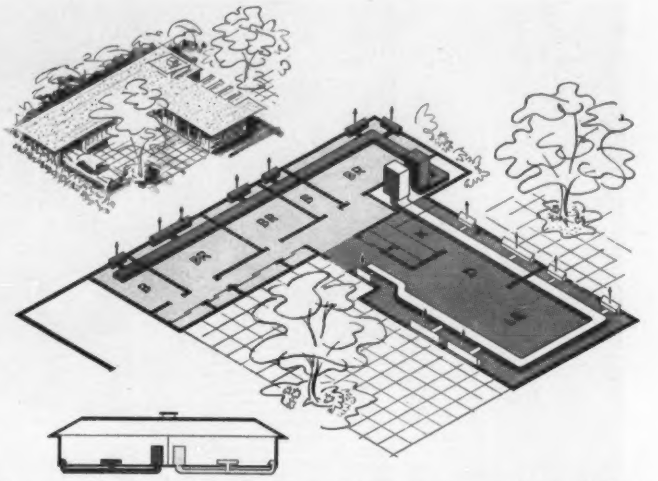

FIG. 1 shows how two furnaces with completely separate duct systems might be applied to a ranch-style house to provide different zoned temperatures for living and sleeping areas.

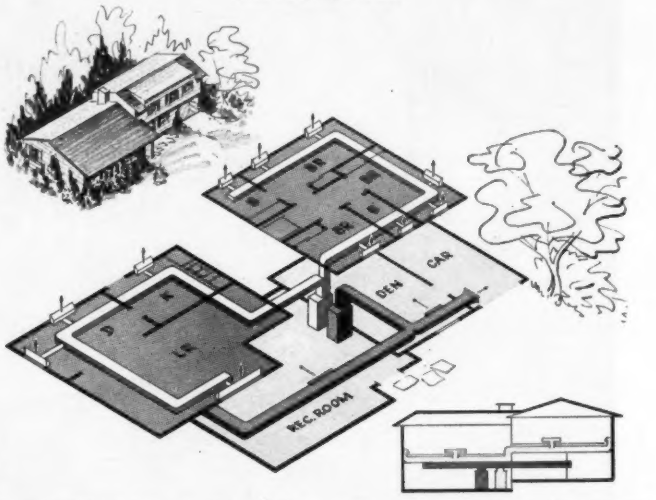

FIG. 2—Split-level house heating problems can be readily solved with two furnaces, believes American-Standard.

## First Broad Attempt Followed '56 Study

First broad attempt to promote zoning for residential heating was made a couple years ago by Minneapolis-Honeywell Regulator Co. following a market study in 1956 of current building practices and living habits.

At that time Honeywell concluded that zoning was desirable in at least 20% of the houses being constructed for one or more of the following reasons:

1. Spread-out floor plans. Ranch-type houses are often subject to differences in sun and wind exposures, resulting in uneven heating.

2. Split-level houses. Convection problems between levels can be severe.

3. Large glass areas. Rooms with extensive glass usually require more heat, which, without zoning, leads to overheating of other rooms.

4. Basement occupancy. Widespread popularity of finished basements for playrooms and/or entertainment areas argues for zoning because different factors influence heat loss.

5. Rooms over garages. Floors over unheated areas are likely to be cold unless special provision, such as zoning, is made.

6. Living and sleeping quarters. Many persons prefer different temperatures in these two areas, and this becomes even more pronounced when there are children who retire early.

More than one of the above reasons for zoning can be found in many houses being constructed today, especially those in the $15,000 and up category. It should be pointed out, too, that the reasons may well vary by geographic location because house designs vary in popularity from one area to another.

Zoning can be achieved with a single furnace, of course, through use of motorized dampers controlled by individual thermostats. American-Standard, however, believes the two-furnace approach is simpler.

"Two furnaces for zone control offer no mystery to the heating contractors," believes Henry Rossell, division sales manager. "Sizing the ductwork and balancing a two-furnace installation is actually simpler than for a large, single furnace installation."

## How 2 Zone Control Can Be Applied To Modern Homes

How two-furnace zoning might be applied to typical modern house designs is indicated in Figs. 1 and 2.

Shown in Fig. 1 is a ranch-type house. Note that one system takes care of the "living" quarters including the kitchen, dining, and living rooms. Second system handles the bedrooms and bathrooms.

How the more difficult problem of a split-level house can be approached is shown in Fig. 2. Here one system heats the basement recreation room and the grade level den and garage. Second system serves the two upper levels where the conventional living and sleeping quarters are located.

With a typical two-story house of conventional design, the obvious zoning arrangement is to have one system for the first floor and the other for the second floor.

Does the use of two furnaces and two separate duct systems

*(Concluded on next page)*

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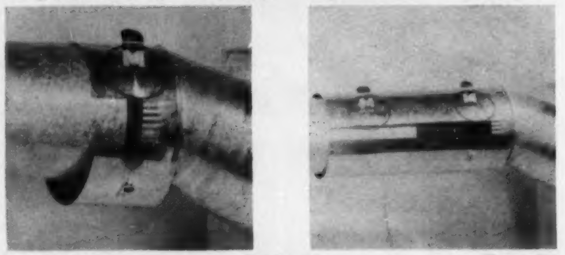

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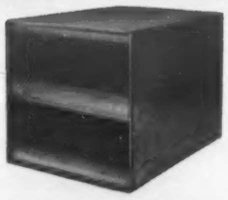

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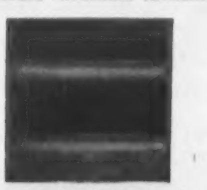

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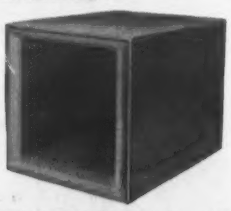

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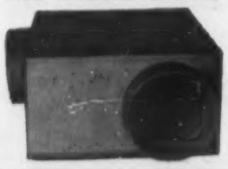

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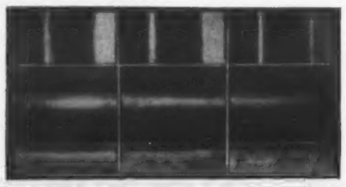

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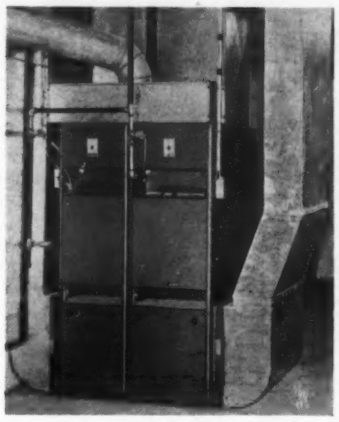

FIG. 4—Some advantages of two-furnace idea are pointed out by W. H. Baker, Jr. (left), vice president of marketing, American-Standard Air Conditioning Div., to Nels Severin of National Association of Home Builders with special display featured at NAHB National Housing Center in Washington, D. C.

FIG. 3—Located side by side or at least close together, the two furnaces and ductwork present no problems for addition of summer cooling equipment.

# 2 Furnaces 'for Price of 1'--

*(Concluded from preceding page)*

complicate the addition of summer cooling equipment? Not in the opinion of American-Standard. The company suggests, in fact, that summer air conditioning could be installed for just one area of the home if it is desired to reduce initial cost.

Where air conditioning for the entire house is to be installed, it's not necessary to have two separate cooling systems, one for each of the heating zones. Usually American-Standard recommends that the two furnaces be installed side by side, as shown in Fig. 3 (which centralizes maintenance and servicing). Thus, it is a simple matter to interconnect the ductwork of the two systems for cooling, there being a shut-off damper in the connection so that the systems are separated for heating.

For really deluxe summer cooling, of course, there would be no technical objections to having two separate air conditioning systems if the owner is willing to pay the additional cost. No doubt the same factors of house design that make zoned heating so desirable would probably apply to zoned cooling as well.

The "two for the price of one" story, however, does not apply to air conditioning. On furnaces, though, American-Standards can quote figure from its Suggested Dealer Price Book to prove its point.

For example, two GLA-100 furnaces (100,000 B.t.u. gas-fired models) cost exactly the same as one GLA-200 unit (200,000 B.t.u. gas-fired). The combination of a GUB-75 and GUB-100 gas-fired units (totaling 175,000 B.t.u.) costs only $19.73 more than a GUA-175, a 175,000 B.t.u. gas-fired furnace. Two B-95-OB oil-fired 95,200 B.t.u. units have a combined cost of but $29.27 more than a single 1315-OB 196,000 B.t.u. oil-fired furnace.

There will obviously be an additional cost involved in the second thermostat for the second system, but some savings are often achieved by simplification of ductwork when two separate systems are used, points out American-Standard.

"Operation of a two-furnace system is less costly than operating a single large furnace," the company also contends. "This is because the use of two furnaces, each controlled by its own thermostat, permits easy adjustment of the equipment to provide continual air circulation with only just enough heat being provided to each area to maintain a constantly uniform temperature. Operation of a large single unit to heat a small area is eliminated.

"It has been established by many tests and a great deal of experience," continues American-Standard, "that a furance which provides continuous blower operation costs up to 20% less to operate than one that maintains an uneven flow of heat by constantly turning on and off.

"Continual motion of air through the ducts does not permit any of the heat to be wasted. The heat from every possible B.t.u. of fuel is instantly carried from the furnace to the rooms," the company says.

Longer furnace life can also be expected with a two-furnace system, according to American-Standard. Balancing the furnace size to area heating requirements assures the most economical and least wearing operation of the equipment. The blower is not overloaded and the temperature rise through the furnace is normal.

Quite a number of builders have featured the two-furnace idea, according to American-Standard, but the company was particularly gratified when the National Association of Home Builders invited the manufacturer to put on a special display explaining two-furnace systems at the National Housing Center in Washington, D. C.

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- **changing territories**
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- **taking on new lines—**

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# C. A. Olsen Names C. J. McLaughlin, Jr.

ELYRIA, Ohio—Appointment of Charles J. McLaughlin, Jr. to vice president in charge of manufacturing of the C. A. Olsen Mfg. Co., has been announced by R. N. Campbell, president, and vice president of Westinghouse Electric Corp. of which Olsen is a subsidiary.

McLAUGHLIN

Olsen manufactures residential warm air heating and air conditioning units.

McLaughlin brings to Olsen more than 20 years of experience in industrial management. Prior to joining Olsen, he was associated with Landers, Frary & Clark Co., New Britain, Conn., which he joined in 1944 as a methods engineer. He served as manager and then director of production engineering in charge of time study, methods, plant layout, and tooling, becoming general superintendent of the New Britain plants.

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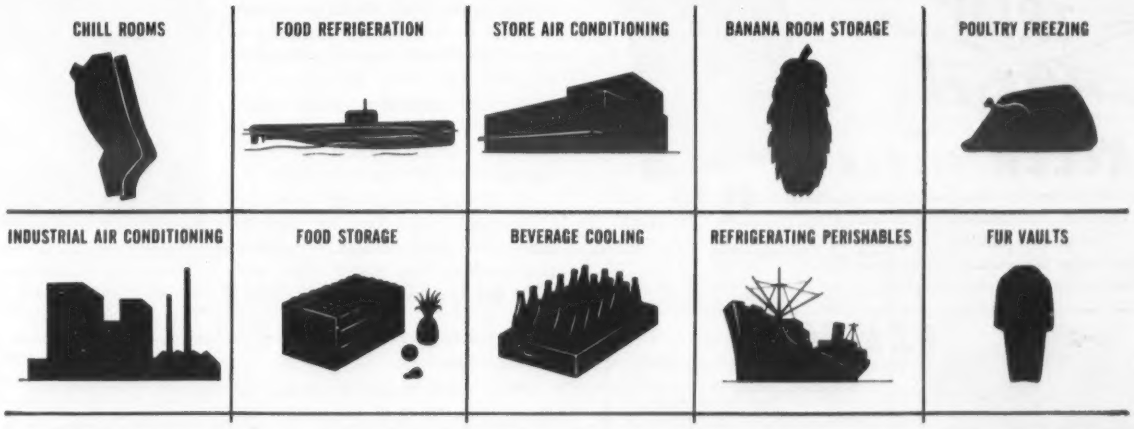

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# New Methods, Forms Can Cut Cost of Handling Parts

## Wholesaler Offers Approach To Shave 'People' Expense

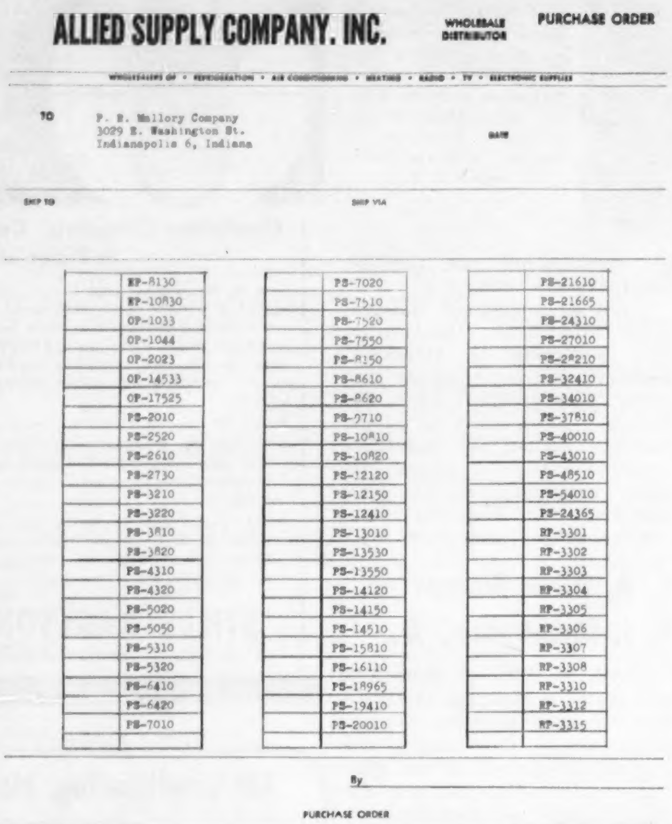
SAN FRANCISCO—"Most of the supply wholesaler's operating expense is in people, so the way to cut costs is to devise new methods, forms, and other things that will reduce the 'people expense.' "

That was the essence of the talk on "Products, People, and Profit" which was given by Jack L. Homan, Allied Supply Co., Inc., Dayton, at the annual convention of the Air-Conditioning & Refrigeration Wholesalers association here.

In his talk Homan presented some new approaches to inventory control, and demonstrated some forms that his firm has started to use to simplify purchasing procedures.

"In the wholesaling business, most of the operating expense is in people," Homan began, "and when you begin to think about reducing expense you have to look at what you are getting from your people, and what you can do to make them more efficient employes.

"In your operations are you checking suppliers' prices, extensions, received merchandise, and freight bills? While all this may seem necessary, have you ever stopped to think that you may be spending $1,000 to save a possible $100 or $200? After all, what are the chances of an incorrect manufacturer's invoice?



**ALLIED SUPPLY COMPANY. INC.** WHOLESALE DISTRIBUTOR PURCHASE ORDER

WHOLESALERS OF • REFRIGERATION • AIR CONDITIONING • HEATING • RADIO • TV • ELECTRONIC SUPPLIES

TO P. R. Mallory Company
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Indianapolis 6, Indiana

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| | OP-1044 | | PS-7550 | | PS-27010 |
| | OP-2023 | | PS-8150 | | PS-28210 |
| | OP-14533 | | PS-8610 | | PS-32410 |
| | OP-17525 | | PS-8620 | | PS-34010 |
| | PS-2010 | | PS-9710 | | PS-37810 |
| | PS-2520 | | PS-10810 | | PS-40010 |
| | PS-2610 | | PS-10820 | | PS-43010 |
| | PS-2730 | | PS-12120 | | PS-48510 |
| | PS-3210 | | PS-12150 | | PS-54010 |
| | PS-3220 | | PS-12410 | | PS-24365 |
| | PS-3810 | | PS-13010 | | RP-3301 |
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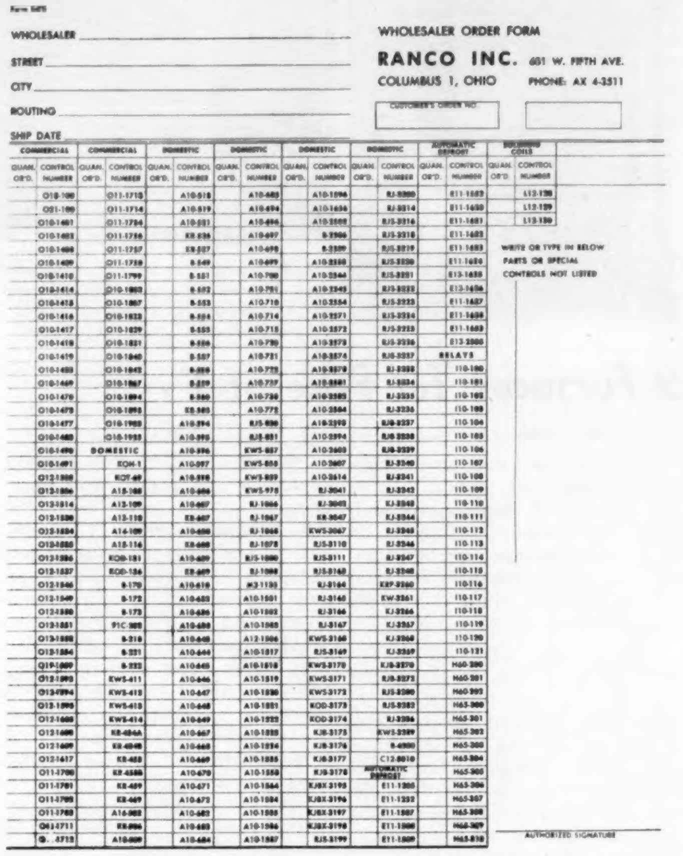
| | PS-4320 | | PS-14120 | | RP-3304 |
| | PS-5020 | | PS-14150 | | RP-3305 |
| | PS-5050 | | PS-14510 | | RP-3306 |
| | PS-5310 | | PS-15810 | | RP-3307 |
| | PS-5320 | | PS-16110 | | RP-3308 |
| | PS-6410 | | PS-18965 | | RP-3310 |
| | PS-6420 | | PS-19410 | | RP-3312 |
| | PS-7010 | | PS-20010 | | RP-3315 |
| | | | | | |

By

PURCHASE ORDER

**SIMPLE ORDER FORM** which Allied Supply Co., Inc. developed can be pre-printed by any organization which has its own duplicating equipment of any type. The form lists the various model or part numbers by which the items are ordered. Purchase order number used is the date on which the order is placed.



WHOLESALER

STREET

CITY

ROUTING

SHIP DATE

WHOLESALER ORDER FORM

RANCO INC. 601 W. FIFTH AVE.
COLUMBUS 1, OHIO PHONE: AX 4-3511

CUSTOMER'S ORDER NO.

WRITE OR TYPE IN BELOW PARTS OR SPECIAL CONTROLS NOT LISTED

AUTHORIZED SIGNATURE

**SOME MANUFACTURERS** have prepared order forms for quick and easy ordering of parts, and a sample of such is shown above. This type of quick order form also permits a quick analysis of purchases for inventory purposes, and thus is another "time saver."

"We've all been lectured on the need for inventory control—but have you ever taken time to determine why it's needed? We began to wonder about it when our visual count inventory showed that we were always overstocked on the same items.

"Of course, there were some obvious reasons for this. On certain 'convenience' items which you must stock—such as motor pulleys, gaskets, and some types of fittings—there will be overstocking because it is inconvenient and inexpensive to place too small an order.

"Other factors that contribute to this overstocking are manufacturers' quantity packaging and pricing practices."

So Homan set about to devise a system that would require less time and effort of personnel, and at the same time provide the type of adequate inventory control that would hold markdowns on merchandise to a minimum.

First step was to label all stock shelves and bins with the exact name and model number of the item, and the quantity of the item that represents an adequate stock.

Next, the day-to-day activities of the countermen were analyzed, and it was determined that they had a fair amount of "free" time. So the wholesaler placed the inventory control of a group of items into the hands of each counterman. Instead of registering a complaint about the added burden, the countermen expressed them-

(Concluded on next page)

NOW... STOP ROOM AIR CONDITIONER AIR FILTER PROBLEMS ...and profitably, too!

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TRIM TO SIZE

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EZ KLEEN
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EZ KLEEN® FILTER

The perfect solution for those troublesome special sizes. Aluminum . easily cut with scissors or knife . . . won't shed particles . . easy to wash. Eliminates large inventory of special sizes. Packaged in colorful polyethylene envelopes.

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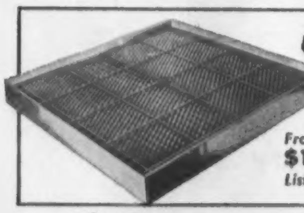

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AIR FILTER FOR STANDARD SIZES
The high efficiency washable, aluminum filter in all standard sizes, in ½", 1" and 2" thicknesses. With the Trim-to-Size Filter, eliminate virtually all room air conditioner inventory problems.

From $1.46 List Price

PLUS ODOR REMOVAL Feature for EXTRA PROFITS
A sales feature you can offer only with R P Super Handi-Koter. This one pint container of water soluble Super Filter Coat, the dust, pollen, and odor-removing adhesive, with a built-in detergent, is a fast-selling, profit-making repeat item.

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RP SUPER
handi-koter

RP® Products of Research
RESEARCH PRODUCTS Corporation
Dept. 20, Madison 1, Wisconsin

NOW.. FROM REMCO
MOLECULAR SIEVE FILTER-DRIERS with DEPTH FILTRATION

REPLACEABLE CARTRIDGE TYPE
"T" FITTING TYPE
SEALED TYPE
REMCO MOLECULAR SIEVES FILTER-DRIER

Utilizing advanced design Molecular Sieve cartridges, these new Remco Filter-Driers combine unequalled drying efficiency, effective acid removal, generous flow capacity and *depth* filtration.

The massive depth filter completely removes all scale, sludge, carbon and other particles as small as 100 microns. Molecular Sieves adsorb and retain large quantities of moisture even at refrigerant temperatures of 140F, and keep moisture concentrations below 10 ppm. Acids are reduced far below dangerous corrosion limits.

Compact in size, the filter-driers are U/L Approved and may be used for Refrigerants 12 or 22, Carrene or methyl chloride. Working pressure is 500 psi; minimum bursting pressure, 2500 psi.

*REPLACEABLE CARTRIDGE TYPE* units use an "O" ring for a positive, leakproof flange seal. From 3 to 40 tons, with ⅜" thru 1⅝" sweat connections.

*SEALED TYPE* filter-driers are available in 1 to 12 tons, with ¼" thru ⅝" flare and ⅜" thru ⅞" sweat connections.

*"T" FITTING TYPE* in 2 to 6 tons, are readily adaptable to systems using conventional "T" driers.

Remco Molecular Sieve Filter-Driers are available at leading wholesalers. Ask your wholesaler for more information, or write for Bulletin MS-1. Remco, Inc., Zelienople, Pa.

REMCO
MANUFACTURERS OF ADVANCED REFRIGERATION PRODUCTS
Filter-Driers • Liquid Indicators • Receiver-Driers • Check Valves • Safety Devices • Frost-Tite Flare Nuts

# Methods Cut Handling, Inventory Cost--

*(Concluded from preceding page)*
selves as being pleased to be given such responsibility.

Next step taken was a listing of the manufacturers, with order routine for each described.

Then Homan came to the conclusion that the ordering procedure was one of the big time consumers in the company's operations, so he developed his own quick order form.

This wholesaler's purchase order form (see illustration) is the essence of simplicity, and is the heart of Allied Supply's new purchasing and inventory control methods which Homan declares has reduced operating expenses significantly. The forms, listing the various model or part number by which the items are ordered can be pre-printed by any duplicating method which the wholesaler may care to use.

Furthermore, some manufacturers have prepared wholesaler order forms in much the same style (see illustration) which makes it unnecessary for the wholesaler to prepare his own.

For the purchase order number the date is used (an order placed on Nov. 1 of last year would be 11-1-58). The quantity to be purchased will be decided by the employe who has the control of the particular item, and he will base his decision on a determination of how much is needed to bring the inventory up to the previously determined level.

The quick order form also permits a quick analysis of purchases for inventory purposes, although Allied Supply still uses a visual count on about 20% of the items it stocks, primarily those which account for the bulk of the wholesaler's dollar volume.

As a method of combatting obsolescence in its inventory, Allied Supply Co. stamps all merchandise with the year in which it was counted for actual inventory purposes. Thus, if too much merchandise with old dates shows up in the visual check, it is obvious that the particular item is being overstocked, or the stock rotation is not functioning properly.

# Increase In Number of Stock Turnovers Called Key to Increase In Year's Profit

SAN FRANCISCO—One way to greater profits in a parts and supplies wholesaling operation is to increase the number of stock turnovers per year, according to Charles G. Koopman, vice president, Supply Distributors Corp., Boston, in a talk given before the annual convention of the Air-Conditioning & Refrigeration Wholesalers.

Present trend among wholesalers is to carry smaller stocks and turn them over faster, even though the average margin of profit may be lower, said Koopman, who will be president of the ARW in the coming year. One of the major advantages of an operation on this basis, he said, is that less capital is required.

Four stock turns a year is about the minimum that a wholesaler can "live with" and if he can increase this to as many as seven, it may advance his net profits very substantially, it was pointed out.

Koopman gave this simple illustration of how added turnover can help the profit picture. A firm with an average inventory of $25,000 a year doing $100,000 in gross sales per year with an average mark-up of 30% would have a $30,000 gross profit, and probably a net profit of around $5,000.

However, one more stock turn, pushing the gross sales to $125,000, would mean a gross profit of $37,500, and a net profit of possibly $10,000. Reason for this is that with the business geared to the $100,000 figure, it usually costs little more to accomplish the one extra turnover.

How do you increase stock turnover? Looking at it from one side of the business, the obvious method is to increase sales. However, Koopman also points out that inventory control is important, and suggests these steps for the wholesaler management:

Take a look at your stock at least six times a year.

Eliminate the slow movers, even if you must reduce profit margins on these items drastically.

Keep a close eye on seasonal items, merchandise that is becoming obsolete, duplicate items.

# Douglas Heads Westinghouse Appliance Sales

PITTSBURGH — William A. Douglass of Chicago has been named general sales manager of Westinghouse Appliance Sales (WAS), specialty distributing organization for the firms' room air conditioners, dehumidifiers, major appliances, TV receivers, and stereo-fidelity instruments.

The announcement was made by L. G. Berger, WAS general manager.

Douglass has been manager of WAS northwestern region with headquarters in Chicago.

# Master Electric Executives Retire

CLEVELAND — Daniel T. Warner, president, and William R. Clements, sales vice president of The Master Electric Co. Div. in Dayton of The Reliance Electric & Engineering Co. here, retired from these positions on Jan. 1. Both will continue association with the management in Dayton as advisors.

Walter H. Haber, a vice president of Reliance, has direct responsibility for the operations of Master Electric. He has appointed John E. Walker as assistant division manager. George A. Goodwin will continue as works manager and Ted A. Nelson as manager of engineering.

Two new departments have been created for which Robert L. Wolfe has been appointed manager of product development and James E. Stahl product manager for marketing gearmotors, fractional horsepower motors, and brakes.

# Airtemp Appoints 3 New Factory Branch Managers

DAYTON — Appointments of new factory branch managers for Chrysler Corp.'s Airtemp Div. have been announced by F. J. Laughna, director-branch operations.

They are: Lawrence H. Baker, New York City; Charles M. Barr, New Orleans; and Robert L. Williams, Houston, Texas.

Baker joined Chrysler as a field engineer with Airtemp's Construction division in New York City in 1952, becoming a senior engineer in 1956. He held a similar post with Airtemp in Miami prior to his new post.

Formerly manager of Airtemp's Houston branch, Barr joined the division in 1953 as a district manager in Dallas.

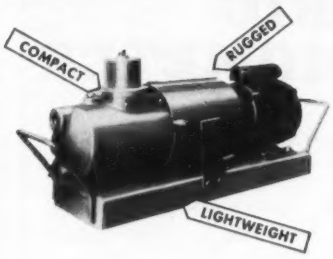
Williams served from 1950 to 1954 as president of his own firm, Homemaker Appliance Co., Houston. Most recently he was in charge of branch operations in Houston for O. A. Sutton Corp.

# Dividend Declared

SCHILLER PARK, Ill. — Directors of Controls Co. of America declared a quarterly dividend of 20 cents a share on the company's capital stock.

for DEHYDRATING and TESTING...

BEACH-RUSS *Portable* VACUUM PUMPS



Beach-Russ Portable Vacuum Pumps are designed *specifically* for dehydrating and testing refrigeration and air conditioning units. These high performance, quiet operating, portable pumps are available in two sizes:

- Model A Two-Stage Pump—1/10 mm. vacuum, blank flange, 2.5 cfm, 1/3 HP, weight 80 lbs.
- Model O Single-Stage Pump — 1 mm. vacuum, blank flange, 1 cfm, 1/6 HP, weight 48 lbs.

*Beach-Russ Vacuum Pumps are also made in types and sizes for evacuation and testing of refrigeration equipment on a production basis.*

**BEACH-RUSS COMPANY**
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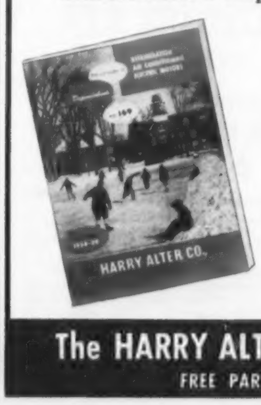
That's because they're so very *hot*. Every month Harry Alter's buyers fill our famous Flyer with all kinds of special closeout bargains carefully picked from manufacturer's surplus. You can save 50% or more, from the regular wholesale price.



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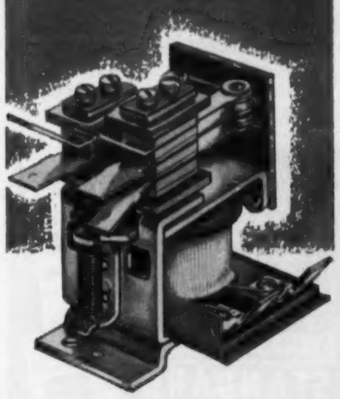

...with the 98000 Series A.C. or D.C. General Purpose Relays

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| 2 PDT 15 amps.<br>4 PDT 6 amps.<br>6 PDT 3 amps. | Max. Contact form with rated current at 32 V. DC or 115 V. AC (non-inductive load) | 2 PDT 15 amps.<br>4 PDT 6 amps<br>6 PDT 3 amps. |

*Consult your RBM Application Engineer or write for Bulletin 1060.*

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# You Asked About It

**Q. I have met the claim that at least some of the hermetic compressors are so constructed that liquid may be charged by vacuum to the low side of the compressor from a charging board. Those who should have proper information on the subject are reluctant to give a definite answer to this question. Have you any authoritative information?**

**M.A.W.—Jacksonville, Fla.**

Yes, some experienced servicemen charge liquid into the low side of hermetic compressors in the field, most often without approval of the compressor manufacturer.

In addition, however, there are a few compressor producers who do allow this practice—but only to those servicemen who have attended a factory school and learned the technique firsthand. They are reluctant to have others try this charging method for obvious reasons.

The NEWS is presently in contact with all major compressor manufacturers and a future column in Technical Center will discuss this entire subject from both the manufacturer's and serviceman's viewpoints.

**Q. I am finding a number of aluminum evaporators in household refrigerators and freezers which have been damaged or have developed pinholes. I have tried a number of aluminum solders with no success including one turned out by Aluminum Co. of America called "Alcola."**

**Have you any information on repairing these aluminum evaporators?**

**C.J.R.—Moorefield, Ky.**

While there are several items on the market which are claimed to be effective in repairing aluminum evaporators, Aluminum Co. of America is dubious of their ability to stand up under the conditions which exist in a freezer or refrigerator.

Incidentally, the product "Alcola" is NOT produced or sold by Aluminum Co. of America.

There is no indication that these products will harm food; the difficulty is their apparent inability to withstand the repeated expansions and contractions due to temperature changes.

U.L. & A.S.M.E.
WATER-COOLED
CONDENSERS ½ TON to 15 TONS
and
LIQUID RECEIVERS
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EVERY REQUIREMENT
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NEW KMP KAP-KIT
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**Now** KMP KAP-KIT gives servicemen a complete, tailored assembly for replacement in the field ... the proper size drier for the capillary. KMP KAP-KIT provides precision metering control for all refrigerants and has the drier in the proper location used by *all* leading manufacturers—*The LOW SIDE.* When drier is placed in refrigerated position at the end of the capillary, desiccant adsorbs *more* moisture and, more important, *retains* the moisture.

Insist on Exclusive KMP KAP-KIT...a strainer assembly, Moisture Magnet of spun copper (in all popular sizes), plus flare nuts and bonnets ... uniformly produced at lowest cost.

*This assembly can be used with either Freon 12 or Freon 22.*

**Write** today for information and prices.

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KENMORE MACHINE PRODUCTS, INC.
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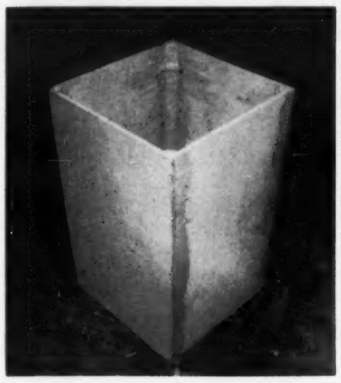
U.S. Patents RE. 22,465 and 2,430,692

# Asbestolux Offers Workability, Durability As Material for Fabricating Ductwork

WORKMAN reinforces corner joint of duct with asbestos cement. Asbestolux can be glued, taped, cemented, or laminated, according to the firm that produces it.


FINISHED duct section made of Asbestolux is said to be particularly suitable for installations where fire, heat, or chemical resistance is required.

* * *

CHICAGO—A new material with an "unusual combination of properties and characteristics" is being used extensively in the fabrication of ventilating, exhaust, and heating ducts by Asbestos Duct Constructors here.

The material was selected for duct fabrication primarily because of its ease of handling, workability, and durability, it was reported.

Called "Asbestolux," the material is described as an incombustible insulation board, composed of a little-known variety of long-fibered South African asbestos bonded under high pressure steam with top-grade silica. The board was only recently made available to U.S. users by North American Asbestos Corp., Chicago.

Comparable in cost to common forms of cement asbestos board, Asbestolux is said to be as workable as wood and very light in weight. It weighs about 14 oz. per square foot in ¼-in. thickness. It is resistant to fire, heat, moisture, steam, chemicals, and corrosion, the report said.

According to Asbesto Duct Constructors, the material is ideal for construction of ducts used to exhaust fumes from laboratories and chemical processing areas. It is claimed to remain stable in the face of continuous attack by corrosive vapors, acids, and alkalis.

"Resistance to temperatures up to 2,300° F. also makes it a prime material for high temperature ductwork," the report stated.

Depending upon the application, Asbestos Duct Constructors use ¼-in. or ⅜-in. thick Asbestolux. The board is shipped in crated packages containing 4-ft. by 8-ft. sheets.

"Sides of ducts are cut to specified size by using a regular power saw," it was explained. "Steel angle brackets are screwed into the cut pieces to hold the sides together. Predrilling is unnecessary.

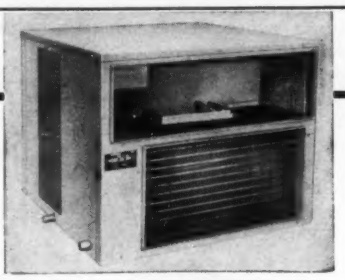
"Protection of the brackets and joint reinforcement are provided by the application of asbestos cement."

Asbestos Duct Constructors has equipped a major Chicago hospital, two nationally-known laboratories, and a leading chemical firm with installations of the new ducts, it was said. Several additional jobs are under way or planned for 1958.

**For Your Reprint Copy**

"Emergency Diagnosis, Repair of Hermetic Unit Electric Components," by John L. Zant, mail this ad with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort, Detroit 26, Mich.

Only 25¢ each.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You'll get added sales from quiet, efficient installations—the kind you make easily with compact Comfort-Aire. Available in summer-winter heat pumps or straight cooling only. UL Approved.

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See our complete line and new products at Booth S-67, International Heating & Air Conditioning Show, Philadelphia, January 26-30.

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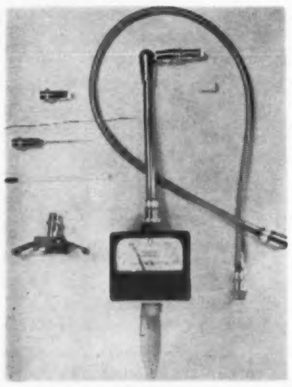
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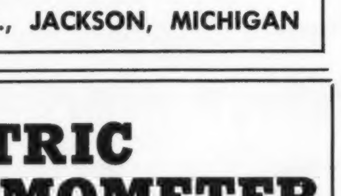
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No more guesswork about the condition of your F-12 and F-22 refrigerant systems.
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...LOWEST COST MOISTURE REACTOR PROTECTION PLUS ALL THE PROVED LIQUID EYE FEATURES!
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IT'S GOOD
The MOISTURE-REACTOR is composed of alternate, permanent and changing (Reactor) color bars. When all the bars appear the same color (green)—it's good—there's no moisture in system.

IT'S BAD
If moisture enters the system, every other color bar changes from green to yellow—then it's bad—the dehydrator should be replaced. When the system is moisture-free again, the Reactor color bars will change back to their original solid green color.

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OVER 1,000,000 LIQUID EYES SOLD TO DATE!

# Philadelphia Air Conditioning Show--

*(Concluded from Page 1, Col. 5)*

the level of new construction. (On pages 43-45 of this issue is an article detailing how sales have paralleled the construction curve.)

On the basis of available figures, including the NEWS' studies on all installations made in a select number of cities (one of which appears in this issue), the greater proportion of central residential systems now seems to be in existing homes. Since existing homes represent a much greater market, this would seem to be a favorable factor for increased sales.

In the commercial and industrial market, the greater potential is also in existing buildings, and while detailed breakdowns are difficult to obtain, there seems to be some evidence that a greater proportion of the dollar volume the past couple of years has been going to installations in existing structures. Thus, the industry may have made a start in pulling away from the construction curve.

While the industrial market awaits the big surge that will come with "complete" air conditioning (meaning comfort cooling), industrial establishments generally are using more of the field's products—in terms of improved heating installations, and a wide variety of ventilating and air cleaning devices.

The battle lines between types of equipment are quite well known. Manufacturers and contractors are not exactly "innocent bystanders" in the contest between the electric and gas utility interests to convince the public that they offer the best type of "fuel" for year-round air conditioning systems. How well they succeed in their promotion and public relations campaigns may have a marked effect on the kind of products that the industry makes and sells.

Hydronics (wet systems) may be making more of an impact in the commercial and industrial field than in the household field. Certainly the packaged chiller has become a major factor in all sizes of commercial and industrial systems within a few years—and in many cases has established the groundwork for full wet systems.

For big building air conditioning, high velocity systems continue to gain in popularity. In many instances, they combine with fan and coil or multizone type systems to provide flexibility and the most desirable conditions. Package units, particularly as the air-cooled unit tonnages are extended upwards, seem to be gaining increased favor in new as well as in existing big buildings.

Another element in the picture is the use of individual room units—installed through the wall. These have found a place in both new and existing construction of all sizes—from the smallest home to the largest office building.

What this all adds up to is that the industry has the products to fit any demand by the buyer—or the contractor. This will be amply demonstrated during the Exposition in Philadelphia.

# Hall-Neal Appoints Gombert Gen. Manager

INDIANAPOLIS — Appointment of Fred S. Gombert as vice president and general manager of Hall-Neal Furnace Co. and plans for a three-year expansion program were announced by Fred S. Boone, president.

He said plant facilities at 1324 N. Capitol Ave. will be expanded both in size and equipment. This will enable Hall-Neal to expand the Victor line of heating and air conditioning equipment and to add new products.

Gombert formerly served as sales manager of Hall-Neal from 1946 to 1954, leaving to become vice president and manager of the Ingersoll Conditioned Air Div. of Borg-Warner Corp. located in Kalamazoo, Mich.

*'Operation Teamwork'*

# RACCA Re-aligns National Organization To Accomplish 8-Point Program for '59

WASHINGTON, D. C. — The Refrigeration & Air Conditioning Contractors Association has launched an ambitious program —to be known as "Operation Teamwork"—for 1959, according to an announcement by President C. L. Walling.

Eight objectives of the program were listed:

1. A drive to increase membership threefold by next October.

2. A campaign to encourage the adoption by members of "the highest standards of ethics and fair play."

3. A "powerful effort to eliminate any and all practices which would necessarily result in unsatisfactory execution of a job—which would reflect unfavorably upon the entire industry; manufacturers and RACCA members, alike."

4. An effort to foster a spirit of friendly, effective cooperation between RACCA members at local and national levels.

5. A plan to enlist the manufacturers' cooperation in "discontinuing certain warranties that cannot and are not being properly fulfilled."

6. A compilation of data "to assist manufacturers in improving their products. Better communications channels will be actively sought between manufacturers and RACCA members in an effort to make speedy correction of faulty equipment. Lack of such communications obviously burdens RACCA members with excessive 'no charge' service to their customers."

7. A plan for quickly alerting the membership wherever faulty equipment appears in a member's area.

8. Improve bargaining agreements between local RACCA chapters and the refrigeration divisions of United Association local unions, and to better the relations between manufacturers, RACCA, UA, and the customer.

In order to accomplish these ambitions during 1959, President Walling has re-aligned the RACCA national organization, as follows:

A new headquarters has been established in Washington, D. C., under the direction of Leo Howard Kerns, who is the new managing director of the association. The office is located at 1632 K St., N.W.

Another new office has been opened in Los Angeles, at 458 S. Spring St., under the direction of Henry B. Ely, who has also been appointed general counsel for the association.

The eastern zone, under Kerns' direction, is divided into three regions, as is the western zone, under Ely. The six regions and the respective supervisors are:

Eastern Zone: Northeast region — Harvey W. Hottel, Washington, D. C.; southwest region — Robert S. Lafferty, Miami, Fla.; central region—Harvey O. Miller, Chicago.

Western zone: Southwest region — William M. Moody, Houston, Texas; mountain state region—T. C. Alexander, Denver; western region—Don L. Kissell, Los Angeles.

Walling said these regional directors and supervisors "have been given both the authority and the finances necessary to tighten up RACCA chapters, expand them, and to see that our aims for 1959 will become a reality."

# ASHAE Convention Program--

*(Concluded from Page 1, Col. 5)*

can Society of Heating & Air-Conditioning Engineers.

The meeting is being held Jan. 26-29 at the Bellevue-Stratford hotel here. The program calls for one technical session Monday morning, Jan. 26, two on Tuesday morning, two on Wednesday morning, and two on Wednesday afternoon.

Among other events on the program are a welcome luncheon Monday and the annual banquet Wednesday evening. Mayor Richardson Dilworth of Philadelphia is scheduled to address the luncheon.

Principal speaker at the banquet will be Dr. Eric A. Walker, president of The Pennsylvania State university. His subject is "The Morning After for Education." Another banquet feature will be installation of 1959 officers. The banquet will be preceded by a social hour and followed by dancing.

The program (somewhat condensed) follows:

**MONDAY, JAN. 26**

9 a.m.—First Session: Topical Session on Comfort—Charles S. Leopold, Philadelphia, moderator.

"Researches on Heating and Ventilation in Relation to Human Comfort," Dr. Thomas Bedford, London, England.

"Metabolic Patterns in Stressful Environments," Dr. Nello Pace, Berkeley, Calif.

"Environment Reactions In the 80 to 105° F. Zone," Burgess H. Jennings, ASHAE director of research, and Baruch Givoni.

12:15 p.m. — Welcome Luncheon (Ballroom). Speaker: Hon. Richardson Dilworth, Mayor of Philadelphia.

7:30 p.m. — Get-Together Party (Grand Ballroom, Sheraton hotel).

**TUESDAY, JAN. 27**

9:30 a.m.—Second Session.

"Supply Outlet Locations for Basement Heating," J. R. Wright and D. R. Bahnfleth, Urbana, Ill.

"Pulsations In Single-Port, Gas-Fired Residential Heating Equipment," C. F. Speich and A. A. Putnam, Columbus, Ohio.

"Low Frequency Combustion Noise In Oil-Burning Equipment," G. J. Sanders and W. E. Lawrie, Chicago.

"Omni-Directional Low-Speed Hot-Wire Anemometer," J. F. Kemp, Pretoria, South Africa (by title only).

9:30 a.m.—Third Session. Symposium on Hydronics—P. N. Vinther, Dallas, moderator.

"Design of Water Piping Systems," B. L. Sturdevant, Muscatine, Iowa.

"Noise and Vibration In Water Piping Systems," Prof. W. L. Rogers, Evanston, Ill.

"Selection of Pumping Equipment," G. F. Carlson, Morton Grove, Ill.

"Refrigerant Piping," J. R. Chamberlain, York, Pa.

12:15 p.m.—Life members' luncheon.

**WEDNESDAY, JAN. 28**

9:30 a.m.—Fourth Session.

"Frost Formation and Heat Transfer On a Cylinder Surface In Humid Air Cross Flow," Parts I and II, P. M. Chung and A. B. Algren, Minneapolis.

"Downward Heat Transfer Through a Joist Space," P. M. Chung and C. E. Lund, Minneapolis (by title only).

"Annual Energy Use for Electric Space Heating," R. L. Boyd, Pittsburgh.

"Heating by Hypocaust," E. Daisley Thatcher, New York City.

9:30 a.m.—Fifth Session: Symposium On Heat Pump Performance—G. B. Priester, Baltimore, moderator.

"Performance of Water Source Heat Pump for Office Building In Southwest," F. L. McFadden, Jr., Dallas.

"Performance of Water Source Heat Pump for Office Building In Northwest," J. Donald Kroeker, Portland.

"Performance of Package Air Source Heat Pump Units," W. A. Spofford, Tyler, Texas.

"Operation of Large Air Source Central Heat Pump Systems," E. R. Ambrose, New York City.

2. p.m.—Sixth Session.

"Probe for Thermal Conductivity Measurement of Dry and Moist Materials," W. Woodside, Ottawa, Can.

"Heat Gain Through Windows Shaded by Metal Awnings," Necati Ozisik and L. F. Schutrum, Cleveland.

"A New Method for Calculating Radiant Exchanges," Benjamin Gebhart, Ithaca, N. Y.

2 p.m.—Seventh Session: Symposium on Corrosion and Water Treatment—W. G. Hole, Montreal, Que., Can.

"Water Treatment To Inhibit Corrosion," F. Hogdon, Long Island City.

"Corrosion from Insulation," C. E. Ernst, New York City.

"Hot Water and Anti-Freeze Systems," L. D. Polderman, New York City.

"Specification Problems In Water Treatment," W. L. Andrews, Cobourg, Can.

"Taking the Mystery Out of Water Treatment," Mrs. Olivia Burkey, Birmingham, Ala.

6 p.m.—Social hour (Clover Room).

7:15 p.m.—65th annual banquet (Ballroom). Speaker: Dr. Eric A. Walker, president, The Pennsylvania State university.

**THURSDAY, JAN.29**

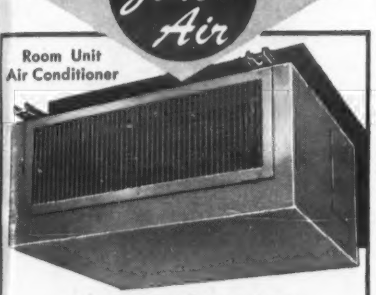
10 a.m.—Council meeting.

10 a.m.—Auf Wiedersehen coffee hour (Clover Room).

# Va. Smelting--

*(Concluded from Page 1, Col. 4)*

At the same time, du Pont's Freon Products Div., and the Ansul Chemical Co., jointly announced termination of their sales agencies agreement on the refrigerant line. The agreement had been in effect since Dec. 26, 1957, when du Pont discontinued the policy of selling "Freon" refrigerants through national distributors and named Virginia Smelting and Ansul as its sales agents at the wholesale level.



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**CAP TUBES** give perfect results "as is" for all units to ⅕ H.P., freezers to ⅓ H.P., and water coolers to ¼ H.P.

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**SPECIAL COMBINATIONS** are available for use up to ¾ H.P. for R-12 and R-22.

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# Bid Depository--

*(Concluded from Page 1, Col. 5)*

The new rules are held not to violate the anti-trust laws providing defendants remain subject to all provisions of the judgment.

As reported in the Sept. 29, 1958 issue of the NEWS, the three rules of the depository which Gilbert H. Jertberg, former U. S. District judge here, disapproved and called "price tampering" were changed to comply with his findings of fact, conclusions of law, and judgment of last May.

These changes were made in July and the depository has continued its operations, which began in 1950.

The new rules permit combinations of bids for plumbing, heating, and ventilating; forbid withdrawals after bids are opened, and reduce depository fees by successful bidder to ½% of the contract award, with a maximum of $250.

The opinions of Judges Jertberg and Yankwich form a guide to the legal operation of bid depositories, particularly as they affect subcontractors bidding to general contractors.

Judge Jertberg is now on the U. S. Circuit Court of Appeals with headquarters in San Francisco. Judge Yankwich of Los Angeles is chief judge for the Southern District of California.

While the actual title of the case is U. S. A. vs. Bakersfield Associated Plumbing Contractors; Kern, Inyo, and Mono Counties Sheet Metal Contractors Association; and Kern County Electrical Contractors Association, the proceedings concern themselves with the bid depository operated by these three trade associations.

Basic in the Yankwich judgment are two provisions: To secure compliance the attorney general or the assistant attorney general in charge of the Anti-Trust Div. may at any time in writing request that representatives of the Dept. of Justice have access to all records of the bid depository relating to the subject matter of the judgment.

Jurisdiction is retained by the district court. Either party may apply to the court at any time for further orders and directions.

Defendants are enjoined and restrained from engaging or participating in agreements which would renew any of the practices ruled against in the judgment of the two judges.

Particularly, no inducement may be offered to withdraw any bid after it has been opened at the depository.

CHIEF ENGINEER

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Excellent opportunity for man with good refrigeration background and experience in all phases of Bulk Milk Cooling for farms. Write either address below giving all details, Education, Experience, and Earnings. Interview at Smyrna, Delaware or Niles, Michigan.

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WANTED, ADDITIONAL lines of equipment—Coils—air conditioners, refrigeration equipment, grills, compressors, condensers etc. As manufacturer's representative in western Michigan. Now have unit heaters, gas conversion burners, small boilers. Two representatives, both men with years experience in air-conditioning and refrigeration with major manufacturer. WILMOT'S, 1067 Bridge St., N. W., Grand Rapids 4, Michigan.

ADV-SALES PROMOTION Director—Do you need a wide awake man with the ability to take charge of your advertising and sales promotion? Experienced in digging out facts, originating and supervising programs, working with other departments and handling executive duties. Background includes experience in sales promotion, adv. mgr., and agency executive with international manufacturers. BOX A6174, Air Conditioning, Heating & Refrigeration News.

POSITIONS AVAILABLE

SALES ENGINEERS required for Detroit, Des Moines, Houston, Kansas City, Sacramento, Saint Louis and San Diego. Opportunity to become associated with local sales organizations now calling on engineers, contractors and dealers. Advanced design products with highly respected brand name and broad market coverage offer a real opportunity to the right man. Write about yourself and experience including income expected. All letters will be answered and those selected will be notified of time and place of interview. Write to D. G. Merrill, ACME INDUSTRIES, INC., Jackson, Michigan.

WANTED: EXPERIENCED refrigeration service man for factory service engineering, servicing ultra low temperature testing chambers, Freon 13-Freon 22 cascade systems. Desire man living in the Los Angeles area. Apply to Mr. E. A. WRIGHT, Suite 25, 3848 E. Colorado Blvd., Pasadena, Calif. Telephone RYan 1-0181.

REFRIGERATION ENGINEER to direct design and development section of small L. I. New York company. Prefer man with experience as project engineer on design and development of packaged industrial products including refrigeration and compressed air. Resume and salary requirements to BOX 244, Massapequa, New York.

SALES MANAGER — Sales manager opening in air conditioning equipment manufacturing concern on the West Coast. Desire man with strong background in the industry. Product distributed on a national and international basis. Send resume including employment history, salary requirements, and recent snapshot. BOX A6166, Air Conditioning, Heating & Refrigeration News.

ENGINEER REFRIGERATION Controls—To head a department on design and development of commercial refrigeration control valves of all types; national corporation with midwestern manufacturing and engineering facility; salary and bonus commensurate with work background and ability. Send full details, qualifications and personal data, to BOX A6172, Air Conditioning, Heating & Refrigeration News.

AIR CONDITIONING Product Engineer—Leading manufacturer of air conditioning and refrigeration equipment has opening for project design engineer in newly established engineering section on heat pump and residential package air conditioners. Desire graduate engineer with at least 2 years' design experience on residential air conditioners and refrigeration products. All replies held in strict confidence. Send short resume to BOX A6173, Air Conditioning, Heating & Refrigeration News.

MANUFACTURER REPRESENTATIVE for New York State exclusive of metropolitan New York area. Old, established line of refrigeration accessories selling to leading wholesaler and O.E.M. accounts. Advise territory covered and lines carried. Reply to BOX A6175, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

WANTED: MANUFACTURERS surplus, outdated or obsolete refrigeration items—expansion & water & shut-off valves, controls, relays, dehydrators, units, tubing fittings, etc. All sales on a cash close-out basis, large or small quantity. Write or call: COMMERCIAL CONTROLS CO., 257 East 3rd Street, New York 9, N. Y. ORegon 3-7210.

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COMPLETE HIGHSIDE and low side refrigerator systems. P91 compressor 115 V. 50/60 cy. F-12 Evaporator: 15⅝" wide x 5⅝" high x 12¾" deep, and static condenser. S-88 compressor 115 volts 60 cy. Freon 12; Evaporator 11" wide x 11⅛" deep x 9" high, and static condenser. Systems are charged and ready for installation. Sold $36.00 each FOB Chicago, Illinois. Send for free catalog on money saving refrigeration values. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

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EXCEPTIONAL BUY of commercial refrigeration & air conditioning sales & service business. Best franchises, for sale by owner, everything you need. Walk in and go to work, trucks, tools, shop, warehouse, home if wanted. Will sacrifice for $30,000. Must be seen to appreciate. In Michigan's Water Wonderland. BOX A6164, Air Conditioning, Heating & Refrigeration News.

# AIR ENGINEERING Staff Members Appointed

DETROIT—Appointments of an editor, advertising manager, and editorial advisory board of a new monthly magazine, *Air Engineering,* have been announced by Edward L. Henderson, president of Business News Publishing Co.

Editor of the magazine is Eugene A. Sloane, a former associate editor of "Domestic Engineering" and advertising and merchandising director for Harnischfeger Homes, Inc. He also has held positions as technical editor with Lennox Industries, public relations director for the Trane Co., and with the copy department of Campbell-Mithun, Inc., advertising agency.

Alfred Chadburn, Jr., advertising manager, previously was advertising manager of "Refrigerating Engineering" and the "Air Conditioning-Refrigeration Data Book."

On the editorial advisory board are George F. Taubeneck, Phil B. Redeker, and C. Dale Mericle.

The first issue of *Air Engineering* will be published in April. Its content will be devoted to air pollution control, air moving, and air conditioning engineering.

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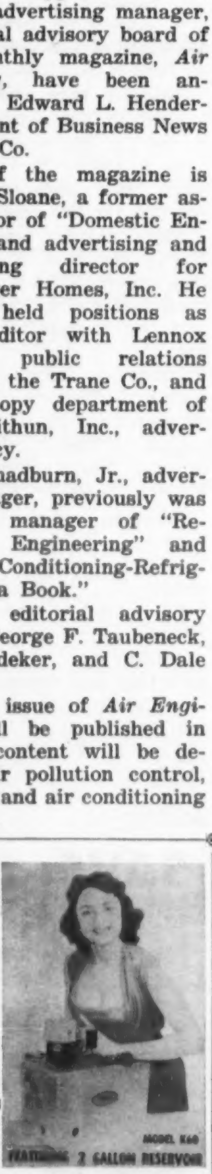

# Temporary Heat Agreement--

*(Concluded from Page 1, Col. 4)*

struction, which has been extended to include air conditioning, refrigeration, and all types of heating.

Key paragraph of the revised agreement is the following: "For harmony and practicality the Pittsburgh Agreement is extended to cover all gas or oil-fired unit heaters, and all refrigeration and air conditioning installations."

The new agreement also provides for payment of time-and-a-half (instead of regular straight time) for all hours worked in excess of 40 per week where the Federal Fair Labor Standards Act applies to the construction job. Complete text of the revised agreement appears on this page.

Immediately after adoption of the temporary heat agreement, John M. Rhoades, chairman of the Joint Industry Program Committee, appointed a four-man sub-committee to consider the merits of advising architects and engineers regarding the importance of writing clear-cut specifications, placing the responsibility for the maintenance of temporary heat in the heating contractor's specifications.

## Sub-Committee Members

Members of this sub-committee will be: Joseph Monahan, Washington, D. C., United Association (AFL-CIO); Harvey Hottel, Washington, D. C., Refrigeration & Air Conditioning Contractors Association; Frank Lawton, Paterson, N. J., Mechanical Contractors Association of America; and Irvin L. Rechkemmer, Canton, Ohio, National Association of Plumbing Contractors.

The Joint Committee also welcomed three organizations as new full scale members. The new organizations, whose top three officers will become members of the over-all committee, are the Refrigeration & Air Conditioning Contractors Association, the National Lead Burning Association, and the National Automatic Sprinkler and Fire Control Association.

This brings to six the number of associations officially affiliated with the committee. The Pipe Line Contractors Association could not send a representative because of a conflict with their annual convention, at which the matter of affiliation with the Joint Industry Program Committee was being discussed.

Peter B. Gordon, MCAA, New York City, chairman of the sub-committee on electric heat, presented his report of a proposed program to study impact of electric heat on the plumbing and pipe fitting industry.

Gordon was directed to discuss plans with such organizations as the Oil Heat Institute and the American Gas Association, to determine their reaction and possible assistance to the contractors-union program.

Three United Association representatives will be appointed to serve as permanent members of this sub-committee, instead of an observer as was originally planned. Three representatives of RACCA will also be seated on the electric heat study group.

John J. McCartin, assistant general president of UA, gave background information on the recent agreement between the UA and the Sheet Metal Workers regarding installation of back panels for radiant fin tubes.

Proposed by-laws for permanent organization of the JIPC were presented by Martin J. O'Donoghue, representing the lawyers' sub-committee. The by-laws were amended and approved by the committee.

## Agreement

The original Pittsburgh Agreement covering jurisdiction of Temporary Heat in Buildings Under Construction, as amended on Jan. 9, 1959, by action of the Joint Industry Program Committee, is as follows:

"Be it Agreed: That this work in question comes under shift time and be at the regular straight time rate. Where the Federal "Fair Labor Standards Act" applies to employment, one and one half (1½) times the regular straight time wages shall be paid for all hours worked in excess of forty (40) hours. They further propose that the classification of buildings be left to the adjudication of the Local Conference Committees.

"The heating systems referred to in the original Pittsburgh Agreement include:

"Steam boilers operated at pressures up to fifteen (15) pounds per square inch and all hot water heating boilers.

"All steam heating systems using steam from any source whatsoever.

"All hot water heating systems operated by forced or gravity circulation using hot water from any source whatsoever.

"For harmony and practicability the Pittsburgh Agreement is extended to cover all gas or oil fired unit heaters, and all refrigeration and air conditioning installations.

"The original Pittsburgh Agreement, being a National Agreement, is binding on all local bargaining units of the Plumbing and Pipe Fitting Industry; furthermore, the Pittsburgh Agreement, as extended on January 9, 1959 is also binding on all local bargaining units of the Plumbing and Pipe Fitting Industry."

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FACING GRAND CIRCUS PARK

DETROIT

# Many New Products, Methods, Concepts Make Bow at Show

*(Concluded from Page 1, Col. 3)*

under the auspices of the American Society of Heating & Air-Conditioning Engineers in conjunction with its 65th annual meeting. The event will have some special significance to visitors in the engineering professions because of the recent consolidation agreement between the ASHAE and the American Society of Refrigerating Engineers, which is now awaiting final approval of the various official bodies of the state of New York.

The following briefing on some of the new items heralded for introduction at the Exposition is aimed at assisting those readers who will not be in attendance, but who will be interested in some of the new items available.

The information is based on material submitted by manufacturers who were agreeable to submitting "preview" information on their exhibits. The first part is devoted to such previews where the manufacturers identity is revealed. The latter part discusses some other new developments, where the identity of the manufacturer is not being revealed before the Show opens.

## Some New Items

A 100-hp. hermetic centrifugal compressor system and a "Comfort Center" residential air conditioner. (York Corp.)

"Jet Room Balancer" for hard to heat-or-cool rooms. (Viking Air Products.)

Packaged liquid chiller, high velocity "Electro-Cell" filter. (American Air Filter divisions.)

"Thermo-Center" slim furnace which can be connected to outside air-cooled condensing package for year-round conditioning, new central air conditioner, Modular induction air movers. (Carrier Corp.)

A 150-ton "Dri-Fan" evaporative condenser and a 17,000 c.f.m. high-pressure air conditioning unit. (Recold Corp.)

### NEW ELECTRIC, GAS CONTROLS

"Selectografic" supervisory data center, and new series of electronic air cleaners. (Minneapolis-Honeywell Regulator Co.)

"Versatrol" a basic gas cock safety combination, to which various types of thermostatic operators and gas-pressure regulators can be added for modification of any installation. (General Controls Co.)

New pleated dispensable media filter and new kinds of roll-type filters. (Farr Co.)

Refrigerant hose and reusable couplings for use with pull-out units and automotive air conditioning, new lightweight charging and testing unit. (Imperial Brass Mfg. Co.)

Thermostatically controlled motorized valve that permits individual temperature control of multiple zones with only a single circulator. (Heat Timer Corp.)

### CHANGES AIR FLOW DIRECTION

Remote outdoor compressor heat pump unit with universal blower matching indoor air handling unit of type that permits air flow direction to be changed in the field. (Heat Controller, Inc.)

Four newly designed window air conditioner compressors, and three compressors for heat pump applications. (Tecumseh Products Co.)

"Comfort Curtain" air distribution system for heating and ventilating classrooms, churches, and office buildings; new industrial heaters with "dual fuel" burner. (Lennox Industries.)

New concept in design and installation procedure for all hydronic heating and cooling systems, and new line of refrigeration compressors in 2, 4, 6, and 8-cylinder models. (Bell & Gossett Co.)

New mat-faced duct liner, filter media in new rolled form. (Owens-Corning Fiberglas Corp.)

New packaged air conditioners, designed for greater flexibility and ease in installation, in sizes from 3 to 75 tons. (Typhoon Air Conditioning Co.)

### WALL-HUNG ODOR REMOVER

Activated charcoal odor remover designed for flush wall mounting in kitchens, lavatories, recreation rooms, and offices. (Barnebey-Cheney Co.)

New cooling-heating conditioner, large remote control units, cleanable shell-and-tube condensers, combination air-cooled water-cooled condensers. (Dunham-Bush, Inc.)

New silent gas valve, non-linting gas pilot, electric heat thermostat. (White-Rodgers Co.)

"Watertemp" cooling tower with internal decking of special design plastic material, and dry blower towers with squirrel cage blowers. (Binks Mfg. Co.)

Electronic air cleaners made in sizes to match system heating or cooling coils. (Trion, Inc.)

New distant reading vapor tension dial thermometers for use in piping systems, new distant reading gas-filled dial thermometers for use in ducts. (Marsh Heating Equipment Co.)

### INSTALLATION ACCESSORIES

Eight new products, including angle filter-driers, "Y" strainers, charging lines, strainer-capillary tube combinations, terminal seals for sealed units. (Henry Valve Co.)

Flexible pipe insulation, and new plastic skewer to make installation of polystyrene and corkboard insulation easier. (Armstrong Cork Co.)

New Mark II boiler-burner unit, water chiller, and fan-coil unit, typical heating-cooling layouts. (National-U. S. Radiator Corp.)

New industrial air conditioners of the packaged type, ranging in size from 20 to 60 tons; new 50% lighter and smaller water chillers. (Acme Industries, Inc.)

### HIGH VELOCITY MIXING BOXES

New "Thermotank" perimeter and ceiling high velocity mixing boxes, and a new series of perforated air diffusers with matching return or exhaust vents. (Air Devices, Inc.)

Packaged water chiller, complete with an "Eclipse" compressor and motor drive, and suitable for use with either Refrigerant-12 or 22. (Frick Co.)

Close-coupled multi-cylinder compressor, more compact in design. (Vilter Mfg. Co.)

New three-way solenoid valve for fan-coil units. (Jackes-Evans Mfg. Co.)

Duct lining material that has unusually high flame resistant characteristics. (Gustin-Bacon Mfg. Co.)

### HOISTING, CLEANING UNITS

Water-cooled air conditioners, hoisting equipment, cleaning and de-scaling unit, and forced air unit with coil for heating and cooling. (Hastings Air Conditioning Co.)

Basement, lo-hi-boy, counterflow, and horizontal model furnaces, with new design features, and air-cooled central residential air conditioning equipment. (Armstrong Furnace Co.)

New air dryer using electrically regenerated drying agents. (Dry-omatic Corp.)

New, advanced design contactor for air conditioning, refrigeration, and heating. (Furnas Electric Co.)

Air conditioning furnaces which automatically change over to deliver the right amount of air for winter heating and summer cooling. (Coleman Co.)

Seven new products, including a turbine open compressor line, air-cooled condenser, reciprocating water chiller, and sidewall diffuser. (Trane Co.)

Small 15-ton IB press brake for the small metal fabricator. (Niagara Machine & Tool Works.)

All-aluminum "Airline" grilles, new types of registers. (Waterloo Register Co., Inc.)

### FOR SYSTEM BALANCING

Air velocity indicator, for balancing heating and air conditioning systems; air servicing indicator kit for taking temperatures simultaneously in warm air supply ducts and cold air returns. (Bacharach Industrial Instrument Co.)

New products for distribution of room air. (Titus Mfg. Corp.)

Plastic ceiling diffusers that feature seats that require no gaskets. (Air Guide Plastics Corp.)

New design of mixed flow air impeller to operate in the performance range between axial fans and centrifugal blowers. (Torrington Mfg. Co.)

Plastic and pipe insulation, duct insulation, and sound control systems. (Johns-Manville Corp.)

Complete new line of package liquid chillers, some with semi-hermetic compressor. (Curtis Mfg. Co.)

Long slot diffuser delivering air at 90° to the face without using additional turning vanes. (Universal Diffuser Corp.)

New models of "Controlled Humidity Method" dehumidifying units. (Niagara Blower Co.)

### FAN AND UNIT TIMERS

Fan timer miniaturized to fit in a regular outlet box, and a portable time switch for control of window air conditioners. (Paragon Electric Corp.)

Heavy-duty hermetic compressor analyzer and electrical tester especially for air conditioning and refrigeration. (Airserco Mfg. Co.)

Comprehensive performance measurement device developed for engineers, architects, planners, and installers. (Drayer-Hanson Div., National-U. S. Radiator Corp.)

New leak detector designed for use by air conditioning and refrigeration servicemen; new outdoor control system. (General Electric Co., Apparatus Sales and Appliance Control Depts.)

New larger capacity filter-driers, refrigeration mufflers, disposable refrigerant containers. (Tube Manifold Corp.)

Damper and quadrant regulators to offer effective methods of preventing air leakage and rattles. (Elgen Mfg. Corp.)

### OIL & GREASE REMOVER

A pressurized degreasing solvent for removing oil and grease from electrical equipment, and cleaning metal parts. (Chemical Solvent Co.)

Conic-flow silencer for all types of air handling systems whether they be low pressure or high pressure, and whether the acoustic levels be high or low. (Industrial Acoustics Co., Inc.)

Special blowers, the hard-to-design types that are important in successful operation of air conditioners, plus standard lines of air moving assemblies. (Lau Blower Co.)

**REPRINTS**
**SELLING FOR PROFIT.**
By Frank Klein—Only $1.00 ea. Clip this ad and mail with your name and address to: Air Conditioning, Heating & Refrigeration News, 450 W. Fort St., Detroit 26, Mich.

Flexible ducting designed exclusively for low and high-pressure air conditioning systems. (Flexible Tubing Corp.)

Among other new items heralded for introduction at the Show, but not identified by manufacturer, are the following:

A forced-air electric baseboard. A line of infrared radiant heaters, imported from Europe, with a silica glass enclosed element mounted—in the manner of a mercury-vapor lamp—in a chromium-plated trough which is permanently hung on wall or ceiling.

### ELECTRIC DUCT HEATER

An electric duct heater for pre-heating and re-heating air conditioning ducts.

"The smallest baseboard radiation unit on the market," with highest capacity and elimination of noise problems, will be featured in a display that will include a brand new design for apartment house radiation.

In the department of wet heat will be a completely new packaged boiler with zone control valves assembled and wired inside the casing. A brand new product will be a 25-ton chiller, direct fired with natural or LP gas, that produces either hot or cold water.

For those interested in heavy equipment one exhibit will feature gas, oil, or gas-oil burners for boilers equipped for pressure firing, as well as for natural draft. They will handle natural or LP gas and No. 2 fuel oil, change over with the flick of a switch, have a constant-burning gas pilot with 100% shut-off, and a remote oil pump set which does not run on gas operation.

### OUTDOOR-INDOOR CONTROL

In the field of controls, a new thermostat has been developed for use with an outdoor compensating unit to control an air conditioning system in response to room temperature and outdoor temperature changes. Effected by means of a "heat anticipation" adjustment which alters the control point of the room thermostat in response to outdoor temperature variations, the result is an automatic elevation or room temperature in cooler weather and vice versa.

A miniaturized supervisory data center for commercial building control includes a slide projection screen. Each slide contains diagrams or other data required for the supervising of the comfort system. Whenever a particular slide is switched onto the screen, the operating controls are automatically cut into the corresponding system. By touching additional buttons, the operator can then read and adjust temperatures in that part of the building without affecting other areas.

SEE
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AT
THE
PHILADELPHIA
SHOW...BOOTH 306

**CALGON** COMPANY
DIVISION OF HAGAN CHEMICALS & CONTROLS, INC.
HAGAN BUILDING, PITTSBURGH 30, PA.
In Canada: Hagan Corporation (Canada) Limited, Toronto

WHY START FROM SCRATCH?

Anyone who has started a "NEW" business will appreciate the problems and cost. So here is a real opportunity.

FOR SALE

Controlling or minority interest in going successful business as manufacturers' representatives, for refrigeration and air conditioning components, in Southern California area. Established commissions over $50,000 per year with greater potential. Present controlling factor wishes to restrict major activity to other interests but available for part time supervision. Interested only in capital *plus* working experience.

BOX A6163, Air Conditioning, Heating & Refrigeration News.

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**DRINKMASTER**

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**CUBER — COOLER.**

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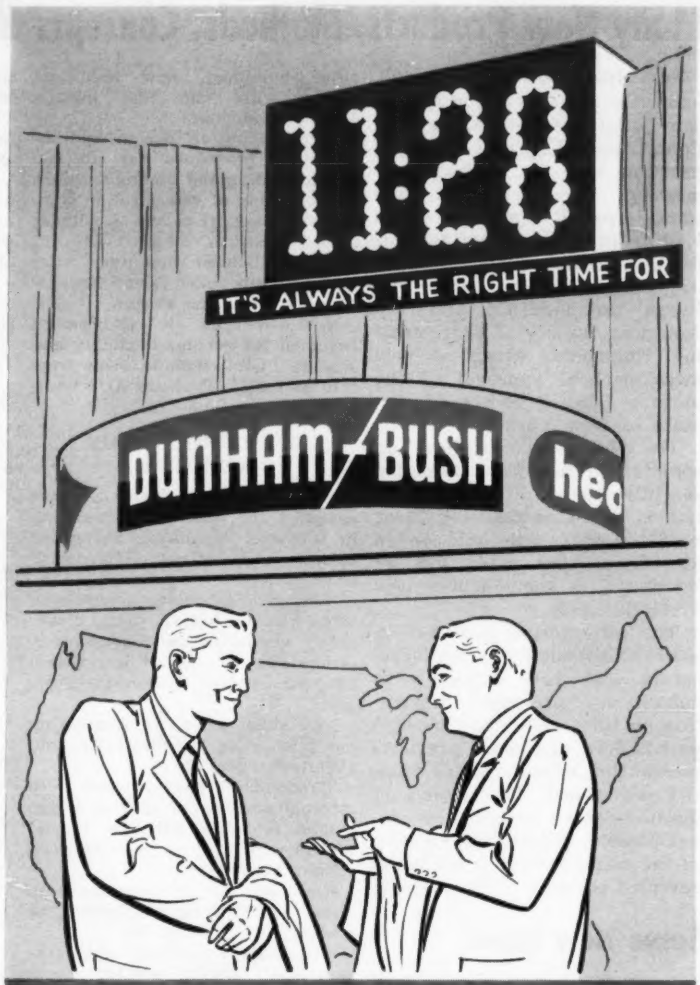
## at BOOTHS 650-750 850-950 ASHAE Show

***. . . where product development worked overtime to bring a DOZEN NEW PRODUCTS***

Tell your friends you'll meet them "under the clock" at the big Dunham-Bush exhibit.

Smart show goers will make tracks for the show's focal point where it's always-the-right-time-for-Dunham-Bush products . . . all 180 of them including a dozen new ones that will be the talk of the show.

Enjoy the show. Profit by spending time where DUNHAM-BUSH PROUDLY PRESENTS THE INDUSTRY'S LEADING LINE FOR '59.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IT'S ALWAYS THE RIGHT TIME FOR
DUNHAM-BUSH
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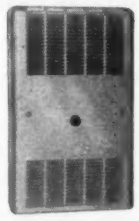
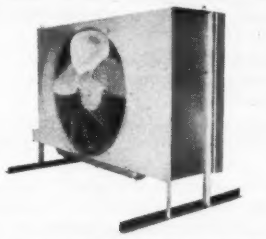
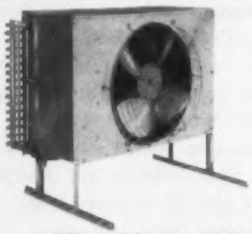
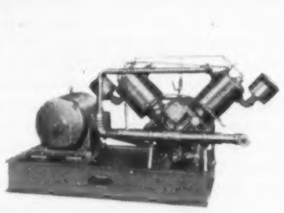
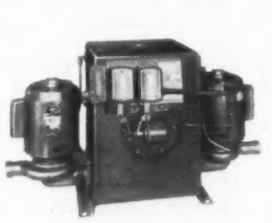

1 "CHC" COOLING-HEATING CONDITIONERS

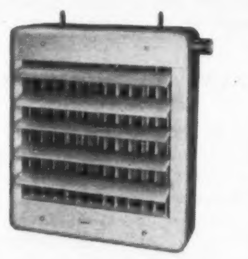

2 "LRCU" LARGE REMOTE CONTROL UNITS

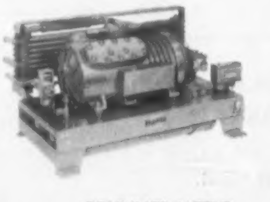

3 "BCW" COMBINATION AIR-COOLED-WATER COOLED CONDENSERS

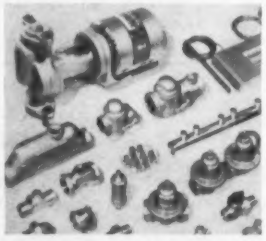
4 "C TYPE" UNIT HEATERS


5 WATER COOLED AIR COMPRESSORS


6 "TYPE CHV-MODEL D" CONDENSATE PUMPS


7 "H TYPE" UNIT HEATERS


8 BRUNNER-METIC 10-15 HP CONDENSING UNITS


9 EXPANDED HOT WATER SPECIALTIES

10 "ARPC" AIR COOLED RESIDENTIAL CHILLERS

11 "CSTC" CLEANABLE SHELL & TUBE CONDENSERS

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your first look
at the new
'PAC'
for the show

12 "PAC" PACKAGED AIR CONDITIONERS

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